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MEDICINE AND SOCIETY.¹

By ERIC G. SAINT,
Perth.

THAT modern society is tending to become fragmented to an increasing extent into a number of self-contained professional and sectional groups, each of which experiences difficulty in communicating its esoteric information and aspirations to others, is obvious to us all. The nuclear physicist finds it hard to explain his thought to ploughman and to poet, the industrial psychologist has difficulty in interpreting his data to management and labour, and even within a profession or trade one expert may find himself unable to communicate with another. Medicine suffers particularly in this respect. Doctors live and practise within a conceptual framework which to some extent separates them from the rest of the community, and unfortunately what they do and achieve is only too commonly interpreted to the citizenry through the medium of sensational journalism. Your College has brought together under one roof a mixed gathering of citizens and medical people, and it seemed only fitting that one should attempt, with what lack of success you shall judge, to treat of those aspects of our rapidly changing discipline, medicine, which most concern a society which in the whole history of mankind has never changed its own appearance so quickly.

¹The Röntgen Oration, delivered at the annual meeting of the College of Radiologists of Australasia, Perth, October, 1957.

Those who work in specialized disciplines are under an obligation, one would submit, certainly to explain and sometimes to justify discoveries which may have incalculable effects on human and technological evolution; and they have to examine periodically their ethical codes and scales of values to see if these conform to the wish of the majority. For, after all, a discipline or a profession exists only by sanction of society, and any hint of arrogance or the exercise of arbitrary power must invite severe censure.

Our greatly improved state of health, our newly enjoyed longevity, our relative freedom from pain—all of which are having profound effects on our mode of living—are phenomena of the last few decades only, and it would seem that we have barely become accustomed to the change. The fact that life may be prolonged on the average to the age of 70 years, and might be prolonged even further were we to drive our motor-cars more carefully, to eschew smoking and to eat and drink less immoderately, is likely to cause economic embarrassment to Welfare States which are under an obligation to provide pensions for the increasing proportion of the population over the age of 65 years. Already the aging structure of Western populations has precipitated a housing and hospital accommodation crisis, and attention has been drawn to the human problems of what to do with the enforced leisure of old age and what to do, in the small houses of modern suburbia, with aging parents. Our improved state of physical health is shifting the focus of attention away from organic disorders towards mental health, in particular towards the problems of boredom and related neurosis in a society already generous with the amount of leisure it awards the individual, and likely to

be more magnanimous when automation is introduced on the widest scale. And in our Stoic-Christian culture suffering, with which pain has been equated, has been regarded as the experience from which the individual acquires grace, dignity and self-knowledge; life altogether without pain, suffering, or social responsibility, some zealots would maintain, is life without meaning, the ultimate decadence. Moreover, until twenty or thirty years ago the human race had no reason to suppose that it lay within its power to alter its own evolutionary destiny. That mankind was the subject of evolutionary forces over which it had seemingly no control, the strong surviving and the weak and biologically inferior becoming submerged, was a belief which prompted arrogance or humility according to individual taste or temperament. But now all but a few born are enabled by modern medical practice to survive in an environment from which much of the harshness of yesteryear has been banished. The feeble-minded reach old age; and genes which formerly led to death of the individual before ever the years of reproductive life were reached are infiltrating populations to an ever-increasing extent. We are indeed changing our destiny with a vengeance, and already notes of alarm have been sounded.

The Evolution of Radiology.

There are good grounds for supposing that biology and medicine are likely to become dominant forces in societies of the future, much in the manner that chemical and mechanical sciences were influential in shaping the society of what we may now call the first industrial revolution, that of the nineteenth century. The search for power—from coal, oil, nuclear energy—is now over, and although we face a second industrial revolution in which power from nuclear fission and electronically devised automation will transform the social scene, the main problem which faces us is biological—that of adapting ourselves as a species upon which newly acquired potentialities have been conferred by modern medicine to an environment over which we are gaining increasing control. Perhaps the best illustration of the late ascendancy of biological science over physical science is the evolution of your own disciplines of radiology and radiotherapy over the last half century, both very much, and with good reason, in the public eye at the moment.

It was in the mid-1890's that von Röntgen first obtained an X-ray picture of a hand by interposing it between a cathode ray tube and a photographic plate. In order that we might gain correct perspective on the evolution of current beliefs, ideas and prejudices, let us remind ourselves that this was the period in which Freud wrote his first papers on the theory of the unconscious, in which Labour members of Parliament first took their seats in the House of Commons, in which Jingoism reached its peak of frenzy, in which the germ theory of disease was perfected, and in which the typewriter was introduced. One supposes that in those early days radiology must have been a hopeful hunting ground to which was attracted the type of men who are half visionaries and half mechanics—visionaries because these early men foresaw some of the benefits which X rays could confer upon mankind, and mechanics because they so obviously enjoyed playing with their machines, as others might enjoy photography or building "Hi-Fi" equipment. Within a decade or two what had been at first an ingenious toy had become an instrument of vital importance in the detection of at least one disease that had been the decimator of populations in the nineteenth century—that is, tuberculosis. After three decades technical improvements were such that it was possible to obtain with the requisite precision pictures of most of the hollow soft-tissue organs of the body; and within the last two decades the introduction of soluble contrast substances has enabled radiologists to depict the anatomy of the circulatory system in a manner which would have quite fascinated William Harvey, the tercentenary of whose death we have celebrated this year. Technically the radiologist and the surgeon have been handmaiden to each other, for the effectiveness of surgery is in proportion to pre-operative precision of anatomical diagnosis, which only the radiologist can on many occasions give. It is quite inconceivable that surgery of the brain, the heart and the lung—to name three of the

most spectacular advances in modern treatment—could have reached present levels of achievement without the vitally important anatomical information supplied by diagnostic radiology.

In the handing out of prizes to those specialties in medicine which have contributed to the astonishing decline in the death rate, the most striking aspect of the social history of the last half century, at least a silver medal, therefore, must be awarded to radiology, the gold medals being perhaps reserved for the microbiologist and the pharmacologist. But the prize-giving occasion must not be the excuse for complacency, for I believe it is true to say that as many problems have been created as have been solved. Radiology, as we know it at present, is as much a technology as a science; the instruments and methods employed in its practice owe their origin to fundamental advances in physical science. This truism particularly applies to the therapeutic use of ionizing radiation, the cobalt bomb and the linear accelerator being almost literally by-products of the laboratory of the nuclear physicist. One foreseeable danger is that the discipline of radiology may founder on the rocks of intellectual sterility if it continues to confine its interests entirely to matters of technique. There are many, possibly too many, roads to Rome, many ways of demonstrating disease states by means of radiological techniques. The over-elaboration of new methods and new techniques is likely to become a futile and wasteful pastime, as is the fate of any discipline which pores too closely over means, forgetful of ends. It is always hateful to have to refer to money; nevertheless, the rising cost of medical care, towards which the more extensive use of diagnostic X rays, the development of complex and expensive equipment and instruments and the need for bigger technical staff have made a very considerable contribution, is a matter of no little concern to us all.

But the most forceful blow to complacency which has been struck is the knowledge that the ionizing radiation which we have used with such careless abandon in the past is not without harmful effects on tissues—how harmful we have as yet no precise means of knowing. For one thing, X rays will induce leukaemia and malignant growths. It is comforting to be told that at the level of dosage to which we are exposed in ordinary diagnostic procedures the risk of developing leukaemia is very small indeed. Nevertheless, that such a risk exists at all is a fact which cannot be ignored, for any increment in the incidence of what is at the moment an invariably fatal disease in the population must lie heavily on our conscience. It is very clearly necessary that we should redouble our efforts to protect the patient and the technician from avoidable exposure, and that we should adopt very strict indications in regard to the use of diagnostic X-ray examinations in the investigation of young people and pregnant women. X rays also induce genetic mutations, the great majority of which are harmful to the species. The increased exposure of the population to ionizing irradiation as a result of the wider diagnostic use of X rays raises the problem of whether, in our zeal to help our own generations, we are not irrevocably harming future generations. Much of the discussion on this vitally important question has hitherto been of such a speculative nature as to lull us into a feeling of false security. The facts are clear. In the first 30 years of life we are exposed to approximately 3r derived from natural sources. The average American citizen receives a further 4.6r from the medical use of X rays, making a total exposure of 7.6r; the average Briton receives less of an increment, about 1r; one would suspect that the average Australian receives a "medical" gonad dose somewhere in between the American and the English doses, there being a likelihood that with improved medical care this figure is rising. Now it has been estimated that a doubling of the mutation rate in the United States would lead in one generation to an additional 2,000,000 instances of tangible inherited defect. In the case of a common mutant like schizophrenia, 63,000 more patients would ultimately require hospital care. The crucial question is, of course, what dose of radiation will double the mutation rate in man? Recent surmises have been within the region of 30 and 80 r. However, experiments on the effect of X rays on human cells grown in tissue culture indicate

that this estimate may be too high, and that 10r may be a more realistic figure of the dose required to double the spontaneous breakage rate of chromosomes. A dose of 10r, you will agree, is getting rather too close to actual human experience to be comfortable. This work was reported on at a meeting of the American Institute of Biological Sciences in August, 1957, and prompted Dr. Bentley Glass to warn us that "if man is foolhardy enough this age may constitute the last chapter of human history, the terminus of the time scale". "At the terminus of the time scale" is an alliterative phrase that H. G. Wells might have used, and expresses very well the deep concern we must all share over the present trend of events.

As a specialty which derived its strength from knowledge of human anatomy and pathology and from electrical engineering, radiology appears to have advanced to a point at which it is in danger of losing itself in the jungle of technological frippery, where it has to some extent helped to precipitate a crisis in the economics of medical practice, and where the ill-considered use of X rays begins to constitute one of the most dangerous threats to the public health that the human race has ever faced. If the discipline of radiology is to survive as a useful aid to human welfare, it must veer a little away from technological and toward biological preoccupation.

The problems hinted at in this review of the evolution of radiology—the technological aspects of medical practice, the economic Leviathan which organized medicine now comprises, and the newer aspects of preventive medicine—are matters about which society is most vitally interested.

Changes in Society.

Before we look at the finer details of these professional problems, let us look first at the changed profile of society itself. Mr. E. H. Carr calls us the "new" society, believing, no doubt, that we have shed all outward and inward signs of the old. Mr. Carr is the comparative anatomist of political economy, and in dissecting contemporary western society finds that only traces of *laissez-faire* economics are to be found in the social organism. The old economic whip can no longer be cracked. Full employment for the able-bodied is forever assured, wages will remain high and will rise higher for shorter hours of work, and the majority of the people from Detroit to Sydney accept unquestioningly the principle that insurance against accident, loss of work and ill health must come out of the paypacket—whether the levy should be raised by Federal or State taxation authority, the union itself or private insurance enterprise, or by a combination of all three contracting parties being a matter of which side of centre the ruling government lies. This is a very different world from that of the 1890's, to which we referred earlier, when doctors who worked in working-class practices spent the greater proportion of their time diagnosing tuberculosis, anemia and rickets, the common diseases of poverty. Social welfare is undoubtedly here to stay as a permanent feature of the political and economic organization of society, perhaps to an even greater extent in eastern countries, which are feverishly attempting to accomplish in the span of two or three five-year plans what it took the west to achieve in 50 years. Medicine, of course, is deeply involved in this social revolution.

Competition has given way to planned economy. Our wills may struggle against the stream, but the urge to coordinate all forms of human endeavour on the grounds of efficiency and expediency affects all levels of society. The corner grocer store makes way for the supermarket; "Morris" and "Austin" merge; group practice attracts the younger medical graduate; the Congress of Industrial Organizations merges with the American Federation of Labour; and an increasing proportion of medical research is accomplished by group project. The individual loses his identity in mass democracy: "The price of liberty [I quote Mr. Carr] is the restriction of liberty." Planning and merger have created a new bureaucracy, a sort of modern fourth estate, which is proving to be infinitely more powerful than any of the other three. We have many derogatory names for this bureaucratic fourth estate; mostly we refer to "those chaps in Whitehall, Canberra, Washington, in the Treasury building, or the ground floor office", as the case may be; but in truth it is to the credit of the much-abused bureau-

crat that he has adapted himself so effectively and efficiently to the social revolution which brought him into being.

These are the outward aspects of social change. The inward aspects include the emergence of a new ethic compounded partly of values derived from the business world (the concept of security, a fair margin of profit, the worship of economic success, keeping up with the Jones's, and so on) and partly of values derived from science. "For the scientist the act of communication is the basic ethical act", wrote Anatol Rapoport in a recent issue of *Science*. This means, one supposes, that to formulate a valid hypothesis or to speak of probability is the ultimate good, if in fact there is any meaning or place for such a word as good in this system of ethics. The business executive and the top scientist now command the greatest volume of news copy, ousting even politicians and film stars from the Press columns. The dimes and nickels and sixpences and shillings which formerly flowed to feed and clothe the naked aborigines of central Africa now pour into funds for medical research. Indeed, we no longer set out to convert the few remaining aboriginal races to Christianity; we hope to convert them instead to western science. Respect for humility and compassion and the eleemosynary virtues, it is to be regretted, fail to thrive in this ethical climate.

And not the least important feature of our contemporary social life is a prevailing spirit of pessimism, attributable in part to the malaise engendered by two wars and the threat of extinction in a third, but more fundamentally related to the economic and psychodynamic determinism which have for so long paralysed critical thought. We may not believe a word that Karl Marx wrote, but a host of persuasive and influential tongues, including those of Shaw and the Webbs, Henry George and Thorstein Veblen, have tried to convince us that our patterns of cultural life are to a large extent economically conditioned. And maybe only the initiated have ever read Sigmund Freud, yet almost everybody is prepared to believe that unconscious drives lie behind human behaviour and apparently freely willed action.

Changing Patterns of Medical Practice.

It is with some hesitancy that one enters this field of sociological criticism, but it has to be done, for it is the obvious truth that the ideas, beliefs and prejudices which prevail at any given moment in a society will have a profound bearing on professional training and practice. What manner of man then, we must ask, is the contemporary doctor? And as a corollary to this question, what sort of man would society like him to be?

We have a curious, not to say unique, historical background. Once we were priests administering the *Æsculapian* rites in temples overlooking a wine-dark sea, and it is a possibility, in the emotional relationship which exists between the modern patient and his doctor, and more particularly between the patient and his psychiatrist in those communities which have warmly embraced psychiatry, that a vestige of the priestly role survives in contemporary guise, just as magic, our prehistoric coin of the realm, still lurks in odd therapeutic corners. For a millennium and a half of the Christian era our diet was the empirical maxims of a few Roman and Arabian physicians. To be sure, after the Renaissance we learnt to dissect the human body in the schools of Leyden and Edinburgh, but lagged behind the engineers, industrial chemists and even intelligent laymen in our respect for the scientific method, until the nineteenth century; then two chemists, Louis Pasteur and Paul Ehrlich, and a German pathologist, Virchow, forced us to take notice that disease might have definitive causes and specific remedies. In addition to doctrinaire controversies, a great deal of our time has been spent over the centuries in domestic squabbles, the physicians leaning heavily on their dignity in their relations with the barber-surgeons, and both treating with contumely the mere apothecary. The designation "general practitioner", who began life as a well-trained apothecary, appeared as recently as 1829 in our language, when an editorial in *The Lancet* referred to "the solid and well founded claims to the public confidence of the general practitioner of England". The birth of the general practitioner, one might add in parenthesis, seems to have been a stormy business, a leader writer of *The Lancet* being impelled to abuse the consultant

"as the mean, tricking, cajoling, concealed, empty-headed steam-manufactured Scotch Dub . . . who hums and hahs, and nods assent . . . converts a red mixture into a white one, coolly pockets his one or two guineas, and laughs in his sleeve at the unfathomable folly of his dupes". Priestly, then, and at times contentious we have been; and more recently, scientific, for once the foundations of biology were laid by the microscopists, by Darwin, Pasteur and Mendel, then the scene was set for scientific advances in every subdiscipline and specialty in medicine. Even clinical practice has succumbed to scientific methodology. Sir Thomas Lewis taught us to apply physiological techniques to the measurement of the symptoms and phenomena of disease, and the statisticians have bludgeoned us into respect for mathematical precision in our measurement of the significance of observations made on the incidence, cause and treatment of disease.

Scientific precision, in diagnosis and in treatment, is indeed a prerequisite of modern medical practice, and in promoting this end it is inconceivable that a medical student should not be deeply inculcated with the scientific method at every stage of his career. But I think that you will agree that to say that a practising clinician should therefore be purely and simply a medical scientist is not ever likely to meet the needs of society. In medical and surgical treatment many situations arise in which alternative courses of action command emotional and ethical rather than strictly scientific considerations, and from a patient's point of view precise diagnosis, which to a doctor affords considerable intellectual satisfaction, may be a matter of indifference. Every patient has some emotional response to ill health, and a good doctor is to be distinguished from a bad one as much on his capacity to dispel unnecessary anxiety and alleviate needless depression, and to aid mental adjustment to chronic illness, as on his mere technical skill in diagnosis and treatment. The ability to handle people with tolerant patience, disciplined compassion and deep psychological insight is as important today, when an undertone of fear—fear of cancer, heart disease, high blood pressure—has been fostered by ill-judged writings in pulp magazines, as it ever was in the past when clinical knowledge rested on less secure foundations. This ability, this art if you will, goes by the name of clinical judgement; it is doubtful whether it can be acquired by an exclusively scientific training in the sort of jigsaw puzzle type of medical course which has evolved in the recent era of scientific medicine. Our American educational colleagues, recognizing that society wants more than just scientific doctors, has attempted to come to grips with the problem by introducing into the medical course an increasing volume of instruction in psychiatry and the social sciences. There has been a great deal of merit in many of the educational experiments; but many of us are inclined to question the validity of some of the postulations of the social scientists, and others might be critical of the overwhelmingly Freudian slant given to psychiatric teaching; and most of us would wonder whether the spending of a hundred hours on the so-called behavioural sciences is not like using a steam roller to roll the lawn.

The problem is a serious one. "One of the dissatisfactions of the public", wrote a leader writer in *The Journal of the American Medical Association* in 1956, "centres around the lack of personal attention given by the modern physician as compared with that given by the old family doctor." This criticism of the modern doctor is perhaps not quite fair, for in all conscience, despite his kindness and his whiskers, the old family doctor was by modern standards dirty, ignorant and therapeutically singularly ineffective. I think the criticism means that patients think that doctors are more interested in the technical dodges used to establish a diagnosis than in them, and that as a profession we are tending to become remote and uncommunicative, and I am afraid that in the atmosphere of the modern specialist teaching hospital these are indeed failings to which we must admit, and against which we must guard ourselves and our students. It is becoming a paradox that we learn how to handle patients in hospitals which are becoming more and more institutes of scientific learning in the various specialties, whereas it remains true that most doctors will be expected to deal with the generalities of morbid experience, in the management of which they will

have to follow the dictates of common sense in preference to prescribed patterns of laboratory investigation.

Having pointed a finger of accusation at some of our practising shortcomings, we must next ask whether the dignity of the professional consultation is being upheld in our present social setting. The standards of care of sick people have improved greatly in this age of social justice since the days when the poor, who comprised at least half of the population, sat patiently on hospital and dispensary benches, to be handed out charitable dispensation by an unknown doctor. However, the solution of many of the economic problems of ill health has brought into existence other problems of equivalent magnitude. It must seem to many of us that the emergence of a bureaucracy or third party of one sort or another threatens to alter in a quite fundamental manner the traditional relationship between a patient and his doctor, and between one branch of the profession and another. In Great Britain, for example, the bureaucracy which interprets the Health Act of 1948 has driven a deep wedge between the general practitioner and the specialist-consultant, and has introduced an inflexibility of medical practice which is not altogether pleasing to the medical profession, and which may not prove adaptable to the social changes which may occur in the second half of the century. In Australia there are already indications that the third party, be it an insurance company or a hospital administration, which pays the piper may call the tune; and in the United States of America, where the proportion of the population which contributes to some form of prepayment medical insurance scheme has risen in ten years from 20% to 60%, the iniquities of third parties are hotly debated. At a recent conference of the American Medical Association held in the Waldorf Astoria Hotel in New York, this subject of what we might call medical practice under contract formed the principal topic for discussion. (Appropriately enough, the drug houses vied with each other in the lobbies for the issue of free samples of the latest tranquillizing drugs.) The crux of the matter seems to be either that a patient may have a limited choice of doctor, or that if he has made a personal choice he is inclined the more readily to change his adviser if he knows that he has a statutory right to repayment for any service received. In either instance, ties between a doctor and his patient are being loosened, and it is a very debatable point whether good medical practice can continue to flourish in these circumstances.

Modern medicine has, moreover, created many difficult administrative problems which affect medical practice. The contemporary specialist hospital has become a big employer of labour. On the one hand its executives are faced with the tasks common to most industrial concerns of preserving good personnel relations and maintaining high morale; and on the other hand the professional staff may be exclusively concerned with advancing research in their several specialties. In this battle of the giants the simple needs of the consumer are likely to be forgotten. The lack of personal attention suffered by the patient in the modern hospital has provoked a great deal of unfavourable comment in recent years. "Nobody told me anything"; "I never knew what was happening"; "I never knew the name of my surgeon"; "I was never told what they did to me"; such frequently voiced statements are indications of a degree of depersonalization of clinical practice which do us little credit. It is rightly and properly the current fashion to extol the virtues of the team approach to practice, to point the finger of pride at the collaborative endeavours of the physician, the radiologist, the surgeon, the anaesthetist, the nurse, the physiotherapist, the occupational therapist and the social worker and what not in the management of disease; but we have to admit that there are certain inherent dangers in this group technique when it is carried to extremes, particularly as it serves as a model for students who will one day accept personal responsibility for human lives. Responsibility to and for patients may be so blurred that it becomes a point of judicial issue whether a hospital or a doctor looks after a sick person, and the complaints I have quoted indicate that the patient may be left in bewildered ignorance of what is going on around him. There is an improbable, but I believe true, story of a Boston hospital of scientific renown which is finding it necessary

to employ ward liaison officers, who are persons of superior intelligence and knowledge, whose function it is to explain to the patient what the doctor, the nurse and the therapists of various sorts are actually doing to him. Gilbert and Sullivan could, I feel, have composed a very happy opera on this theme.

It is not unlikely that you will consider that the shortcomings of hospital practice have been exaggerated, or that such minor deficiencies in the care of patients are more than outweighed by the immense benefits which may be conferred within the walls of these new *Esculapian* temples. This would seem to me to be precisely the point at issue: we are in danger of becoming so intoxicated with our technical successes in the surgical and pharmacological fields that we become forgetful of the simpler human needs—the aim of medicine being not to add new operations and drugs to the museum of experience, to be treasured and admired, but to contribute to the sum total of human happiness and welfare.

And finally, we might ask an almost sacrilegious question: what does the contemporary doctor do? Twenty years ago, when there were fewer specialties and specialists, a high proportion of the medical profession were able to view ill health in its broadest perspective, for of course only in general practice is it possible to understand illness in its family and social setting. The line of demarcation between consulting and general practice was then fairly clearly defined by custom rather than by edict. The picture has changed very considerably. There are now very many—29 I think the tally comes to—specialties to which, by reason of prestige and promise of reward, an increasing proportion of young graduates are attracted, to such an extent that in some parts of the western world—in the larger American cities, for example—there are few family doctors left, so that if your child has a sore throat you have to consult a paediatrician or an oto-rhino-laryngologist. An exaggerated degree of specialism may lead to what Sir George Pickering has referred to as the fragmentation of medical knowledge, and what is more important, to fragmentation of the care of patients. Moreover, we may find ourselves training too many surgeons, gynaecologists, paediatricians and so on for the future needs of society, and in this respect our profession is no different from others which face the problem of redundancy of sections of their labour force in an age of rapid technological change.

There is, of course, a certain glamour about specialism, a glamour which leaves the family doctor out on a limb as the sort of Walter Mitty of the profession. If all serious diagnostic and curative responsibility is to be handed over to the specialist, as it has been by statutory regulation in Britain, then the general practitioner is hardly to be blamed if he labours under a deep sense of injury and injustice. On the other hand, if he arrogates to himself aspects of practice for which he has received inadequate post-graduate training—and we have to admit that it is no longer possible to be expert in every branch of medical learning—society has the right to be severely censorious.

The future of general practice in an era of "scientific" medicine is a problem to which we shall all have to give increasing attention and thought. Probably the best way of approaching the subject is to consider the nature of our responsibilities, and the satisfactions we get out of our work. To make sick people well defines well enough the doctor's curative role; however, changing patterns of morbidity and newer knowledge indicate that it is desirable that medical responsibility should embrace to an increasing degree a preventive way of thought. The family doctor is the instrument by which the infectious diseases of infancy and childhood are prevented and controlled. He may exert his influence wisely in advising the adult to eat, drink and smoke abstemiously, and his observant eye may be the means of preventing accidents to children in the home. He may use his influence to persuade the community that what Professor C. W. D. Lewis has called the "highway holocaust" is both shameful and preventable. Armed with a useful working knowledge of the nature of the human mind and personality, and with an intelligent man's interest in the workings of society, he may prevent or at least keep within the bounds of reason a great deal of mental ill health. And if he cannot prevent carcinoma,

high blood pressure and coronary artery disease, he may at least allay some of the fear that our blood pressure machines, electrocardiographs and articles in the glossy magazines have engendered. Since the disappearance of the infectious diseases from the stage has brought the spotlight on to degenerative disorders, the arthropathies, respiratory and cardiac insufficiency, he can by meticulous attention to detail, and in collaboration with the social agencies which have appeared since the war, make life comfortable and worth while for the many who are chronically disabled. To accomplish all this, which no specialist can do, should (one might have thought) give sufficient emotional satisfaction. But we do seem to be firmly wedded to the barber's knife and the apothecary's drug; perhaps traditional teaching has made us this way. In that case, the sooner we acquire a scale of values in which an intelligent talk with the apprehensive mother of an asthmatic infant is regarded as a more useful and socially desirable act in general practice than removing a diseased gall-bladder or kidney, a job better left to a man with the requisite training and experience, the better will it be for humanity.

Conclusion.

If Francis Bacon was in the hall tonight he would be wrathful with me: "It is in the nature of the mind of man, to the extreme prejudice of knowledge, to delight in the spacious liberty of generality." I have allowed myself the spacious liberty of dwelling on three problems which have arisen at the points of contact between medicine and society, the threatened want of—let us say—humanistic values in medical practice, the administrative and economic aspects of organized medicine and the dangers of specialism, without so far attempting to supply an answer. Indeed, it is in the nature of things that there can be no simple answer to these problems, since medicine is part of a society which is itself undergoing cataclysmic change. You may think it curious that in this context I should wish to quote a remark of a president of an American trade union. Walter Reuther has said that "the real measurement of the worth of a free society is the ability of that free society to translate technical progress into human progress, into human happiness, into human dignity"; this I perceive to be a remark made by a sensitive mind straining to keep alive the human dignities in the wastelands of industrial technology. In medicine—and law, and engineering, and commerce—we must also pause, to ask ourselves why we keep people alive, why we build bridges, or why we divorce unhappy couples. An answer given by Berdyaev, that we are members of a free society which offers "opportunities for creative existence" should satisfy and possibly ennoble us. Our object in medicine is not merely to promote survival; it must surely be to promote survival with purpose and dignity. Accordingly we must display in the way of life of medicine evidence of the acceptance of those values which society expects to see defined by the universities and the professions.

Earlier it was said that the biological problem which has always faced mankind is that of adapting himself to an environment over which he has gained increasing control. In the past medicine has tended to accept a restricted pill-peddling role in human affairs, although to be sure its professional idealism has been enriched by the noble and far-sighted outlook of not a few great scientists and practising doctors. Perhaps we should begin to accept a broader concept of the function of medicine, that of helping mankind to achieve a state of biological adjustment and equanimity in his surroundings. If we were to take this step forward towards an ecological way of thinking, then many of the pieces of the jigsaw might fit into place. In the education of our students we might exchange some of the time at present devoted to applied techniques for leisure to ponder on the nature of man and his institutions. In practice we might redress the disproportionate balance which exists between prevention and cure. And in our contact with patients, both inside and outside our hospitals, we might bring back some of the warmth which seems to be disappearing from human relationships in the modern world, putting technical and administrative machinery in their proper perspective as the means to the end of adjustment and equanimity.

ANÆSTHESIA IN HEART DISEASE.¹

By S. V. MARSHALL,
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It is widely believed, and with much justification, that anaesthesia is generally well tolerated by patients with heart disease. Common experience lends support to this assumption, which is confirmed from time to time by articles and other comment in various medical journals (Ernstene, 1951; Hayward, 1952). There seems to be no doubt that quiescent and well-compensated lesions need not cause the anaesthetist much worry, provided that his technique is reasonably sound. Such confidence is perhaps further encouraged by the rapid and successful development in recent years of cardiac surgery itself.

Obviously, this optimistic view requires modification when signs of impaired cardiac function are evident. In general, the greater the disability, the less will be the tolerance to anaesthetic insult, and so the need for good technique becomes more pressing. Sometimes, however, danger signals are lacking; for example, in middle-aged subjects coronary atherosclerosis may be quite advanced without any indication of its presence. In such cases vascular hypotension during or after anaesthesia may well lead to disaster. Again, there are apparently healthy patients of all ages who, without warning or good reason, will suffer cardiac arrest during anaesthesia. The findings at autopsy are often negative; but it does seem that some factor connected with the anaesthetic is the precipitating cause. This lethal factor is ultimately myocardial hypoxia.

The induction of anaesthesia carries serious dangers in congestive cardiac failure, gross dysrhythmias and recent myocardial infarction (Etsten and Proger, 1955). An acute surgical emergency in the presence of such conditions imposes a very grave responsibility on the anaesthetist. Perhaps too often he agrees to proceed, more or less on the grounds that if death is imminent its actual cause is immaterial, and so any chance of relief from surgery should not be withheld. Whenever possible, however, operation should be delayed for anything up to three months in such cases.

Assessment of Risk.

As has been indicated earlier, the assessment of the risk is necessarily based on the nature of the cardiac lesion and on the degree of consequent functional disability (Beard and Goodwin, 1956). A large variety of factors, including the surgical condition and its possible concomitants of toxæmia, dehydration, malnutrition, shock etc., will considerably influence the margin of safety available. Sometimes this is very narrow indeed.

Not often being experts in cardiology, anaesthetists must generally be content with comparatively simple methods of assessing the fitness of cardiac patients for anaesthesia. They will rely on indications given by the history, the tolerance to exercise, the pulse and blood pressure, the heart sounds and rhythm, as well as by the state of the lung bases, the liver and dependent parts. Radiographic examination of the thorax will help, and electrocardiography may disclose more serious functional disorder than was suspected. Ordinarily, however, if the patient's tolerance to exercise (stated or observed) is reasonably good, gross cardiac irregularities and severe tachycardia are absent and no undue hypertension or hypotension is evident, the added risk involved by careful anaesthesia is small.

The help of the cardiologist is imperative in the more serious cases, especially as regards a correct diagnosis and preliminary treatment. Even if his notions of anaesthetic technique may be somewhat hazy, he is far better qualified than the average anaesthetist to interpret electrocardiograms, to supervise digitalization and other therapy, and especially to reassure his patient about the anaesthetic.

He will certainly avoid stressing the dangers of the situation.

The competence of the anaesthetist and the prudence of the surgeon are also very great factors in reducing the operative risk in patients with cardiac disease. There is no question that modern techniques of anaesthesia, correctly applied, involve practically no added burden to the diseased heart, even when the disability is quite severe. Similarly, good surgery limited to essential requirements will minimize deleterious influences, both during and after operation.

Preliminary Medication.

So far as the anaesthetist is concerned, preliminary medication refers mainly to premedication related to the anaesthetic itself. Nevertheless, he is entitled to reassure himself that adequate sedatives, digitalis, mercurial diuretics, Lugol's iodine etc. have been given well beforehand, when indicated. In urgent circumstances he may be obliged to give digoxin intravenously, especially to control acute auricular fibrillation. Apart from these simple measures, preliminary drug therapy is best left to the cardiologist.

The anaesthetic procedure really starts the night before operation, when the patient must be ensured a good sound sleep. A combination of phenobarbitone (1.0 grain) and pentobarbitone (1.5 grains) is admirable for this purpose. Chloral hydrate and chlorpromazine are perhaps best avoided, because of their cardio-vascular depressant effects. Pethidine (100 milligrammes) may be useful for any nocturnal respiratory distress. At least one hour before operation an opiate, in strictly moderate dosage, together with atropine or scopolamine, should be given. The object is to reduce anxiety without undue respiratory depression, as well as to offset the vagotonic influence of the anaesthetic drugs, which otherwise may cause alarming bradycardia and even asystole (Hunter, 1956). The control of secretions is an important but secondary advantage. While the dosages of morphine, papaveretum, pethidine etc. must be carefully adjusted to suit the patient's age and general condition, full amounts of atropine or scopolamine are generally indicated.

Choice of Anaesthetic.

For the great majority of cardiac subjects general anaesthesia is preferable to local anaesthesia, despite the presumed innocuity of the latter (James, 1957). Local analgesia necessitates heavy premedication to ensure quietude and to abolish emotional reactions, which, together with the adrenaline added to the injected solution, favour the onset of ventricular fibrillation. The associated impairment of pulmonary ventilation, which leads to sub-oxygenation and hypercarbia, further aggravates this risk. All these factors are avoided with well-conducted general anaesthesia.

The old idea of making a single anaesthetic agent do the work must also be discarded, except perhaps in brief minor procedures. Simple "open ether" anaesthesia has a great reputation for safety in heart cases; but while extra oxygen may be easily supplied, the gauze or gamgee mask commonly used interferes with the dispersal of the exhalations, so favouring undesirable hypercarbia. However, when given by a machine which permits suitable aid to ventilation, ether has much to recommend it, even when combined with other drugs.

The intravenous use of thiopentone as a total anaesthetic is also unwise in these subjects, especially since it has a recognized toxic effect on the myocardium (Dundee, 1956). This action, together with an accompanying vasomotor depression, will cause a rapid onset of hypotension that may be dangerous. A case of severe mitral stenosis with early congestive failure is known, in which 100 milligrammes of thiopentone (two millilitres of a 5% solution) produced immediate cardiac arrest, probably from the combined effects of vagotonia, myocardial depression and vasomotor paresis.

Spinal analgesia is also contraindicated in heart disease, especially coronary sclerosis, mainly because of the

¹ Read at a meeting of the New South Wales Branch of the British Medical Association, on September 26, 1957.

associated hypotension. In addition, pulmonary ventilation is impaired by the necessarily heavy premedication, as well as by the degree of intercostal paralysis that may be produced. Emotional factors can still operate, and the frequent need for vasopressor drugs increases the risk of ventricular fibrillation. Alternatively, vagotonia will predominate, again depending on the height of analgesia obtained, and subject to dangerous aggravation by any supplementary use of thiopentone or inhalational agents. Hence the imperative need for atropine or its equivalent before any operation in all cases, let alone in those of heart disease.

It seems reasonable to conclude that general anaesthesia, produced by a judicious combination of agents given in a competent fashion, will provide the safest conditions for operations on the subjects of cardiac disease. In this connexion the relaxing agents are most important auxiliaries, since they afford speedy control over the normal powers of resistance, thus reducing strain and exhaustion. The anaesthetist must have good training, facilities and equipment, as well as the knowledge and means for dealing with emergency developments.

Anæsthetic Technique.

Despite its possible toxic hazards, thiopentone in weak solution (2.5%) and in small dosage (200 to 250 milligrammes), given slowly, is probably the best and safest agent for the induction of anaesthesia in heart cases. Once the patient's immediate reactions have been ascertained, the dosage may be cautiously increased up to 500 milligrammes, which should provide adequate basal narcosis for the rest of the operation. Meanwhile a relaxing agent, preferably tubocurarine or gallamine, in initial dosages of 10 and 80 milligrammes respectively, is given; an artificial pharyngeal airway is inserted, and manual control of pulmonary ventilation is taken over by means of a suitable gaseous mixture delivered from the bag of a closed circuit machine. Owing to a possible vagotonic effect, the depolarizing relaxants (decamethonium, suxamethonium) are perhaps best avoided. If tracheal intubation is necessary, the larynx and trachea should be sprayed with a 4% lignocaine or cocaine solution before the tube is passed.

Anaesthesia is maintained by nitrous oxide and oxygen, in the proportions of 2:1, to which ether or cyclopropane gas may be added if necessary. In addition, further doses of the relaxing agent are given as indications arise. To use ether or cyclopropane in a vehicle of oxygen alone is not advisable, since a consequent lack of reduced haemoglobin in the blood may interfere with the carriage and elimination of carbon dioxide. Towards the end of the operation it is better to deepen the anaesthetic than to give more relaxant, so as to lessen the amount of neostigmine needed at the end. When neostigmine is required, it must be preceded by atropine in full dosage, given at least ten minutes beforehand.

Throughout the anaesthetic it is imperative to maintain thoroughly efficient pulmonary ventilation, not only to provide good oxygenation, but above all to ensure the proper elimination of carbon dioxide. Johnstone (1950) has shown that many cardiac irregularities seen during anaesthesia, especially with cyclopropane, are due to the accumulation of carbon dioxide. These irregularities are of multifocal ventricular origin and may proceed to ventricular fibrillation. Hence, when breathing is depressed or abolished either by deep narcosis or the relaxing agents, or by any combination of these factors, suitable aid to ventilation must be provided. In this connexion it is futile to argue that certain relaxing drugs "spare the respiration"; this specious assertion merely encourages the neglect to secure adequate pulmonary exchanges.

In conducting the reinforcement or control of breathing, a technique of much delicacy must be employed. This involves the intermittent manual compression of the reservoir bag of the anaesthetic machine, although with increasing frequency mechanical respirators are employed.

If any spontaneous breathing is present, inflation must be carefully synchronized with the inspiratory efforts of the patient. Usually it is simpler to abolish respiration completely by means of the relaxing agent, and to institute total control of breathing. Under both conditions the inspiratory impulse should be succeeded by a longer expiratory pause, during which all positive pressure must be removed, so that the lungs can empty and the heart can refill satisfactorily. Some respirators have a negative-pressure phase that is advantageous in this respect.

Throughout the anaesthetic the character and rate of the pulse should be repeatedly noted and the blood pressure frequently taken. The size of the pupils should be checked from time to time, for their rapid dilatation often heralds cardiac arrest. When the relaxing agents are in use, undue lightness of anaesthesia, which possibly favours reflex cardiac inhibition, should be constantly anticipated and prevented. Small increments of cyclopropane or pethidine are admirable for this purpose. The slightest indication of the accumulation of carbon dioxide, such as a rising blood pressure, increased wound oozing and a warm, moist skin, must be detected promptly, and a change to fresh soda-lime effected at once. Intravenous saline therapy should be instituted only when absolutely necessary, and conducted with much care, while any blood transfused should approximate closely to the amount lost. As has already been indicated, strict caution must be exercised in the use of vasopressor drugs. Conversely, the deliberate induction of vascular hypotension is absolutely contraindicated during anaesthesia in the presence of heart disease.

Emergencies.

Some authorities postulate that all major operations, especially on patients with heart disease, should be performed under cover of continuous electrocardiographic monitoring (Johnstone, 1951, 1956). Although such cover is essential in heart surgery, this counsel of perfection is ordinarily quite impracticable and, indeed, undesirable. Even if a large variety of unsuspected cardiac irregularities may occur during anaesthesia, they are very rarely of significance, so that to place emphasis on them tends to divert attention from a more useful source of information—the patient himself. Good clinical observations and good anaesthetic technique still remain the best safeguards.

Any occurrence that interferes with pulmonary and tissue ventilation should be regarded as an acute emergency in these cases. This category includes respiratory obstruction, as from laryngospasm; operative haemorrhage; acute auricular or ventricular tachycardia; heart block; ventricular fibrillation and cardiac asystole. In all, vigorous artificial respiration with pure oxygen is the primary requirement, a relaxant being used in the first instance to break the spasm and to permit intubation. Such inflation alone will sometimes restart the asystolic heart. An irregular tachycardia suggests auricular fibrillation, for which the intravenous administration of digoxin (0.25 milligramme), repeated if necessary, is indicated. If this fails, the tachycardia is probably ventricular and may respond to the slow intravenous administration of procaine hydrochloride (5 to 10 millilitres of a 1% solution) or procaine amide (100 milligrammes).

Widely dilated pupils and a change in the colour of the blood from red to black within about 30 seconds indicate cardiac arrest. In recent years numerous articles have dealt exhaustively with its treatment (Wylie, 1956). Everybody knows about the imperative need for persistent ventilation with oxygen and the early institution of cardiac massage; but the value of auricular puncture seems to have been forgotten. A long needle is passed through the second or third right intercostal space at the sternal border and directed backwards and medially until it strikes the vertebral column. This manoeuvre is repeated several times at slightly different angles, the object being to initiate an impulse by traumatic stimulation. If there is no effect within one minute, proceed without delay to expose the heart, effect defibrillation if necessary and begin massage in accepted fashion.

Summary.

1. Most patients with cardiac disease tolerate anaesthesia well, provided that the anaesthetic technique is sound.
2. However, the margin of tolerance to anaesthesia becomes progressively reduced as the severity of the cardiac disability becomes aggravated.
3. In acute conditions, especially recent cardiac infarction, the hazards of anaesthesia and surgery are grave, so that operation should be postponed whenever possible.
4. General anaesthesia is often preferable to local or spinal analgesia in such cases, to avoid the necessity for heavy premedication as well as the intrusion of dangerous emotional reactions.
5. The anaesthetic technique employed should ensure the maintenance of perfect lung and tissue ventilation throughout the procedure, as well as the avoidance of vascular hypotension both during and after operation.
6. The curariform relaxing agents are invaluable auxiliaries in these respects, since when expertly used they afford excellent control of the patient and so reduce noxious influences.
7. The necessary gas-anaesthesia apparatus provides the immediate essential help for the treatment of any emergency developments—namely, ventilation with pure oxygen.

References.

- BEARD, H. J. W., and GOODWIN, J. F. (1956), "The Assessment of the Cardiac Patient for Anaesthesia", *Brit. J. Anaesth.*, 28: 557.
- DUNDIE, J. W. (1956), "Thiopentone and Other Barbiturates", Livingstone, London.
- ERNSTEN, A. C. (1951), "The Management of Cardiac Patients in Relation to Surgery", *Circulation*, 4: 430.
- ERNSTEN, B., and PROGER, S. (1955), "Operative Risk in Patients with Coronary Heart Disease", *J. A. M. A.*, 159: 845.
- HAYWARD, G. W. (1952), "Anaesthesia and the Cardiac Patient", *Anaesthesia*, 7: 67.
- HUNTER, A. R. (1956), "The Pharmacological Action of Anaesthetic Drugs on the Cardio-vascular System", *Brit. J. Anaesth.*, 28: 544.
- JAMES, N. R. (1957), personal communication.
- JOHNSTONE, M. (1950), "Cyclopropane Anaesthesia and Ventricular Arrhythmias", *Brit. Heart J.*, 12: 239.
- JOHNSTONE, M. (1951), "General Anaesthesia and Cardiac Inhibition", *Brit. Heart J.*, 13: 47.
- JOHNSTONE, M. (1956), "Electrocardiography during Anaesthesia", *Brit. J. Anaesth.*, 28: 579.
- WYLIE, W. D. (1956), "The Treatment of Cardiac Arrest", *Brit. J. Anaesth.*, 28: 551.

PRE-EXISTING CARDIAC DISEASE IN ANAESTHESIA.¹

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THE problem of pre-existing cardiac disease and anaesthesia appears to me to be growing more frequent, probably owing to the fact that the population is aging and more surgery is being done on the elderly. When a physician is asked to examine a patient with cardiac disease with a view to assessing the desirability of anaesthesia, it is, of course, quite impossible for him to dissociate the risks of anaesthesia from the risks of surgery, and therefore surgical shock must come into his thinking. After assessing a case, he has to think of what particular anaesthetics may be dangerous, what drugs should be avoided in the attempt to maintain blood pressure, the dangers of lowered blood volume and the risks of transfusions.

I should first like to discuss with you left ventricular failure. This condition is caused, usually, by hypertension, coronary heart disease, or aortic or mitral valvular disease. This is no time to discuss the relative theories of forward and backward pressures in this condition. However, it is

safe to say that there is a combination of both; that there is backward failure in a rise in pulmonary artery pressure, with a subsequent lowering of the vital capacity and a disturbance of pulmonary ventilation; also there is forward failure with reduced circulation through the kidneys, the extremities and particularly the liver. The circulation through the heart and through the brain is normal.

The most important single factor in the assessment of these patients is a careful investigation of their ability to tolerate exercise. This symptom of breathlessness on effort very rarely lets us down, and on those occasions it is usually in the aged who are inactive, and sometimes in the cerebral arteriosclerotics whose subjective experience of dyspnoea is reduced. Paroxysmal nocturnal dyspnoea is a more serious symptom, which often manifests itself as a nocturnal cough in the aged and is erroneously regarded as chronic bronchitis. The heart is usually enlarged, and next in importance to dyspnoea is the finding of triple rhythm. Atrial gallop rhythm or presystolic gallop rhythm over the mitral area will indicate left ventricular stress, and protodiastolic gallop rhythm or Evans's third heart sound indicates left ventricular failure. Rales at the bases of the lungs are not necessarily indicative of left ventricular failure; they may be present in bronchitis or in the aged, in whom the condition is due to hypostasis.

X-ray examination of the hilar region may reveal a blurring of the outline of the pulmonary vessels, indicating exudation in this region, when there may be no signs of left ventricular failure. Since there is reduced ventilation, anoxia is liable to occur, and anaesthetics prone to produce anoxia should be avoided. If there is a fall in blood pressure, such as occurs in "Pentothal" anaesthesia or surgical shock, there will be a further reduction in blood flow through the limbs, the kidneys and the liver. The last-mentioned organ is a potential source of vasodepressor factor, which is partly responsible for severe irreversible shock, and this fact explains why these patients tolerate shock so badly. But, on the whole, one can say that this cardiac state can be assessed with confidence, and that only in the more severe cases, when the patients are breathless at rest and who have not improved on suitable treatment, should they be denied surgery.

The next condition I wish to discuss is coronary heart disease. This condition is by far the most difficult to assess for anaesthesia and surgery, and is undoubtedly responsible for most of the cardiac mishaps that occur. I should like to stress two points in this condition. One is the fact that a third of the people who on clinical grounds are held to die from coronary occlusions show no signs of a coronary occlusion or myocardial infarction. In other words, the cause of death is cardiac standstill due to arrhythmia. Beck, in his experimental work on the surgery of coronary vasculature, has shown that an uneven distribution of oxygen to the myocardium produces areas of heightened electrical instability, and it is these which fire off fatal arrhythmias; and carrying this idea further, we can see that any factor in anaesthesia or surgery which increases that electrical irritability is dangerous. Lowering of blood pressure due to premedication or anaesthesia—namely thiopentone or spinal anaesthetics—anoxia due to an inefficiently administered anaesthetic or to such an anaesthetic agent as nitrous oxide and oxygen, in which some degree of anoxia seems to be unavoidable, or surgical shock, or some of the drugs used for the restoration of low blood pressure—all these factors are capable of increasing this electrical instability of the myocardium and starting a fatal arrhythmia.

The other factor is the frequent finding of the pathologist that, in cases of sudden death from myocardial infarction, the thrombus, when it occurs in such cases, may be several days old, and may have taken several days to develop to such a degree as to occlude a vessel. The implication of this is apparent. Myocardial infarction following surgery is common, and it would be fair to state that what probably happens is that some factor, such as the lowering of blood pressure through anaesthesia and surgery, leads to the commencement of a coronary thrombosis, which goes on developing and forms a classical picture in the post-operative period.

¹ Read at a meeting of the New South Wales Branch of the British Medical Association, on September 26, 1957.

The diagnosis of coronary heart disease can be difficult. It would be a simple problem if all patients presented with a history of angina or a history of a past infarction. But this is frequently not so, and the condition often masquerades under left ventricular failure or an arrhythmia or absolutely nothing at all, so that on occasions we are faced with a patient with no symptomatology and no abnormal signs, the only abnormality being an abnormal electrocardiogram.

How are we to avoid the anaesthetic and operative dangers associated with this condition? A high index of suspicion must be maintained in relation to people with diabetes or hypertension. Diabetics aged over 50 years with a history of diabetes of over 10 years' duration have an incidence of coronary heart disease of 30% to 40%, and the overall incidence of coronary heart disease in hypertensives is 30%. The finding of an enlarged heart in a normotensive person should make one pause. Triple rhythms are important and, particularly, a lowering of the quality and intensity of the first heart sound—especially the mitral component of that sound—should make one highly suspicious of coronary heart disease. The electrocardiogram frequently has the last word and, much to our embarrassment, is sometimes the only evidence of coronary heart disease, showing arrhythmia, disturbance of conduction and sometimes even signs of infarction.

The electrocardiographic diagnosis of coronary insufficiency owes much to Masters. Dependence on the standard, unipolar and precordial leads, will fail to reveal coronary heart disease in 15% of cases, and I believe that no physician should eliminate this condition without scrupulously following Masters's instructions on the one-step and two-step test. These tests will show, in very close to 100% of cases of coronary heart disease, *S-T* and *T* wave changes.

These people must be carefully prepared for anaesthesia to allay any tension, and I consider that fear and tension can be serious factors in the precipitation of a severe attack of coronary insufficiency. I respectfully suggest that an anaesthetist who examines a patient at 7 o'clock at night for an anaesthetic at 8 o'clock next morning is not going to have a relaxed patient in the anaesthetic room.

With regard to premedication, I should like to point out that chlorpromazine, which is frequently used as a pre-anaesthetic sedative, is also a hypotensive drug. There appear to be certain anaesthetics which would aggravate this problem of oxygen potential. Nitrous oxide appears to be the most important. Two others are cyclopropane and thiopentone (given intravenously).

But by far the greatest problem is that of surgical shock during anaesthesia. Various drugs are used to restore the blood pressure, and this is a matter of extreme importance if the patient has coronary heart disease; it must be realized that some of these are capable of increasing myocardial irritability. It appears to me that by far the safest is Wyeth's "Mephentamine" and nor-adrenaline. However, nor-adrenaline does appear to have some effect on the autonomic nervous system, and I have had a case of auricular fibrillation due to coronary insufficiency which appeared to be caused by the administration of this drug. "Neosynephrine" appears to be a relatively safe drug, but it does have a questionable effect on the myocardium. "Methedrine" is a sympathetic stimulant and can be responsible for arrhythmias, and "Methoxamine" or Burroughs Wellcome's "Vasylor" is definitely contraindicated.

With regard to the occurrence of arrhythmias in this condition, I can briefly sum up my opinion of this problem only by stating that all drugs used in the control of arrhythmias can be dangerous; and in the emergency treatment of ventricular tachycardia or fibrillation, whilst weight for weight procaine amide is safer than quinidine, it can cause hypotension, and this may be a problem if hypotension is one of the factors responsible for the crisis. If one of these drugs is used without success, then one should use the other, and it would be best if it were done under electrocardiographic control.

It is common for physicians to see a patient with hypertension and an enlarged left ventricle together with coronary insufficiency and with cerebral arterial disease—in fact, one can walk into any urological ward and find such a combination. This is a particularly dangerous combination, in that there is a large ventricle requiring a good blood supply. Any factor which will lower this already depleted supply may lead to left ventricular failure. The left ventricular failure will create a vicious circle in that it will aggravate further coronary insufficiency and, on top of this, there is a further lowering in the already reduced cerebral circulation. The whole condition is complex and serious, and can best be managed by avoidance of any factor which will bring this about. Once such a situation has arisen, irreparable damage has occurred.

I should now like to discuss the hyperkinetic circulatory states. These occur in such diverse conditions as pregnancy, hyperthyroidism, beriberi, anaemia, arterio-venous shunts and Paget's disease. In these conditions there is a great demand for increased peripheral circulation. These patients show hot, pulsating extremities with distended veins in limbs and neck. McMichael has shown that the raised venous pressure in these cases is essential for the maintenance of the raised left ventricular output. If the left ventricle fails, we have a condition in which the left ventricular output is lowered in regard to its pre-existing very high level, but is still in excess of normal, and Sharpey-Schafer and McMichael have driven home this point by coining the descriptive term "high output failure".

In this condition the left ventricle can fail in normal people if the demands on it are great enough, or if there are other associated abnormalities such as hypertension or coronary heart disease. If coronary heart disease is present, the myocardium is labouring, with a depleted blood supply, to meet the increased peripheral needs, and anoxia or hypotension will increase the peripheral needs and still further reduce the coronary blood supply. At the same time, in the case of hypotension, there is a lowering of venous return, which must be high for the maintenance of the high output of the left ventricle; so that there is a breakdown centrally in the heart and peripherally in the tissues through the lowered output. Another danger would be rapid infusion in such cases, when the patients are already labouring with a high output and are just coping with what venous return they are receiving. Any abrupt increase in this venous return could overload the left ventricle and precipitate left ventricular failure and again lower the output.

Right ventricular failure is secondary to other conditions—namely, left ventricular failure or pulmonary disease—and it is usually the primary condition which determines the risks of anaesthesia in these patients. It is mentioned only so that I can state that right ventricular failure *per se* is usually not one of the conditions which worry us.

I have broadly endeavoured to show the dangers of pre-existing cardiac disease in its relationship to anaesthesia by describing the physiology and pathology of the conditions, and I hope I have succeeded in driving home the fact that the disturbances precipitated by anaesthesia and surgical shock are complex. In uncomplicated left ventricular failure we can safely assess the problem and have some idea of the risks and how far we can go. Right ventricular failure is, similarly, no great problem. I have omitted congenital heart disease, because the problems of this condition can be broadly grouped in the problems of right and left ventricular failure, and those needing a cardiectomy and bypassing of one side are a subject in themselves.

However, in coronary heart disease the situation is very different. Assessment is difficult and the dangers are great. If there is mishap, the patient may die or be left with a permanently damaged heart. When trouble occurs in this condition, it is usually due to anoxia or hypotension, and a chain of events occurs which can be therapeutically very complex if not almost impossible. If these dangers are to be avoided, anoxia and hypotension must be avoided, particularly in diabetics and hypertensives, and when coronary heart disease is known to be present only surgery with absolute indications must be attempted.

SURGERY DURING BLEEDING FROM PEPTIC ULCER.

By P. A. TOMLINSON,
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THE indications for surgery during bleeding from peptic ulcer are well tested, and there is uniformity in this regard amongst the world's centres. It is not my intention to discuss these here. Nor shall I discuss hæmorrhage from ulcers of the œsophagus or Meckel's diverticulum.

The type of surgical procedure adopted will depend largely on the experience of the surgeon, and on the conditions under which he is operating. Good anaesthesia and adequate transfusion facilities are of course essential.

The purpose of this article is to discuss the technical aspects of the procedures in relation to varying types of disease, and to indicate certain principles in dealing with differing ulcers. In the following discussion it is presumed that good anaesthesia and good resuscitation facilities are available.

SPECIAL PATHOLOGICAL AND PHYSIOLOGICAL FEATURES
RELATING TO BLEEDING ULCERS.

The ulcer may be acute or chronic.

In acute ulceration (including erosions) the stomach and duodenum in most cases are mobile, and the surgeon is not presented with difficult technical problems. Many patients may not have preceding dyspeptic symptoms, and the pre-operative diagnosis may be uncertain. (They may not be known to have an ulcer before laparotomy.)

A chronic ulcer which bleeds is almost invariably penetrating, and most such patients have a long dyspeptic history. On the other hand, surprisingly few symptoms may be present. Penetration of the posterior wall of the stomach and duodenum is much more common than penetration of the anterior wall.

A posterior penetrating gastric ulcer almost invariably causes backache. A posterior penetrating duodenal ulcer may or may not cause backache. Rarely an ulcer may penetrate anteriorly and involve the liver (Case I), the gall-bladder (Case II), or the anterior surface of the diaphragm of the abdominal wall. I have not seen a patient in whom penetration of the colon with hæmorrhage had occurred. Penetration of the common bile duct has been seen, but it is rare. Figure I shows some of the relationships of the penetrating duodenal ulcer.

Bleeding from an anterior gastric ulcer penetrating the liver is much slower and more continuous. These patients have few symptoms, and may present solely with anaemia and melæna, despite the presence of a large ulcer (Case I).

When the ulcerative process affects the blood vessel, it produces a blowout in the side of the artery. The artery is not eroded completely through, so retraction cannot occur. This is an important factor in allowing bleeding to continue.

Most of the vessels in ulcer craters are atheromatous, or show endarteritis.

An ulcer crater which is not excised will heal if the acid gastric juices are prevented from coursing over it. Duodenal ulcers will heal after partial gastrectomy (not including the Billroth I type), though they remain within the lumen of the duodenal stump—i.e., in an alkaline medium. Gastric and duodenal ulcer craters will heal if left *in situ*, provided they are excluded from the lumen of the alimentary tract. A gastric ulcer will not heal with any certainty if it is left within the lumen of the residual gastric pouch.

In some ulcer craters a good deal of infection is present. Persistent or recurrent pancreatitis may occasionally follow gastrectomy for ulcers penetrating the pancreas, resulting in prolonged morbidity. However, fortunately this is rare. It probably accounts for the occasional occurrence of late transient or even prolonged jaundice after gastric resection (Case III), and for some cases of inflammation of the body and tail of the pancreas with per-

sistently high or recurrent high serum amylase readings (Case IV).

A variable amount of exudation from the surface of an ulcer crater occurs, so that when the crater is left *in situ* and excluded from the lumen of the digestive tract, it may be wise in some cases to drain the abdominal cavity for 48 hours. More frequent drainage of the abdominal cavity will, I believe, reduce morbidity. Peritonitis is, moreover, the chief cause of death following partial gastrectomy (Marshall and Reinstine, 1957).

It has never been my practice to coagulate the ulcer crater by diathermy, a procedure which must result in œdema, exudation and necrosis.

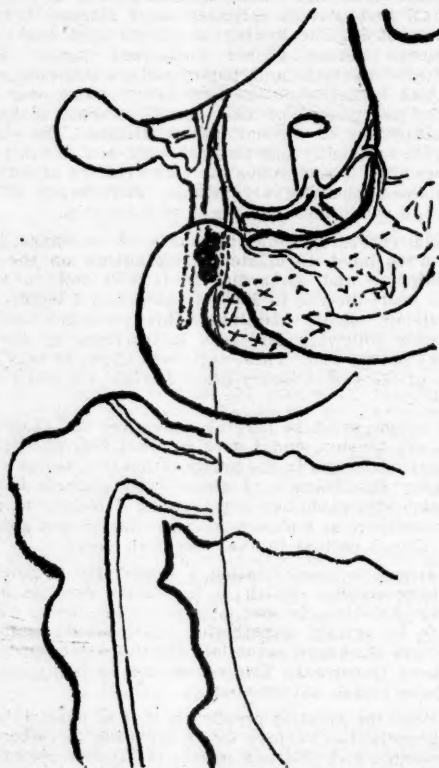


FIGURE I.
Showing some of the relationships of the
penetrating duodenal ulcer.

There is no certainty that a duodenal ulcer will heal after a gastro-enterostomy, unless a high degree of stenosis exists or results, for otherwise the acid gastric juices continue to pass over the ulcer site.

Many anastomotic ulcers escape detection by gastroscopy, being "round the corner" in the jejunum.

SURGICAL PRINCIPLES.

In operating upon ulcers during the bleeding phase, the theoretical principles which surgery must fulfil are as follows: (i) to stop the bleeding permanently; (ii) to cure the ulcer, or ensure its healing; (iii) to undertake no more than can safely be achieved, and to avoid further damage to penetrated structures. In certain circumstances the patient may not be well enough for the second requirement to be fulfilled immediately. In these days, this should be very rare if the patient is referred for surgery reasonably early. If the second requirement cannot be fulfilled at the initial laparotomy, it should be proceeded with as soon as the patient is well enough to stand gastrectomy. If this is

neglected, secondary hæmorrhage is more than likely to occur (Case V).

To Stop the Bleeding Permanently.

1. The vessel is sought for in the ulcer base after the stomach or duodenum has been opened. Paired sutures on either side will produce immediate cessation of blood loss.
2. The vessel should be divided in the ulcer base. Mere suture in continuity has proved to be inadequate, and to result in secondary hæmorrhage not infrequently.
3. The trunk of the vessel entering the ulcer base should be ligated away from the ulcer base *i.e.*, well clear of the stomach or duodenum.

From a perusal of case histories, it is evident that the method of stopping the blood loss by the first of these three measures alone, followed by gastrectomy, has sufficed in a large number of cases and is common practice (Maingot, 1948). It is also evident that a percentage of patients have had further blood loss by melæna and hæmatemesis and even by secondary intraperitoneal hæmorrhage. Occasionally in these circumstances a second laparotomy has been required on account of hæmorrhage, and it is on this account that the second and third measures are recommended, and have become my practice (Cases V and VIII).

To Cure the Ulcer, or to Ensure its Healing.

The requirements are different in gastric ulcer, duodenal ulcer and stomal ulcer.

Gastric Ulcer.

To cure a gastric ulcer surgically, excision of the ulcer along with partial gastrectomy is required. Little technical difficulty is experienced in doing this if the ulcer is low down on the lesser curvature or on the pyloric antral area, and here a Billroth I type of procedure will often suffice. These ulcers can often be pinched off the pancreas. I believe that it is only with an ulcer in this position that a Billroth I procedure should be performed. Vagotomy is recommended when a Billroth I procedure is adopted. However, an attempt to carry out a Billroth I procedure in an unsuitable case may result in the production of recurrent ulceration. The tendency with some surgeons is either to resect an inadequate amount of stomach in order to carry out an anastomosis of the Billroth I type or alternately to have too great an amount of tension at the anastomosis. One of the most difficult cases of hæmorrhage from a gastric ulcer that I have had to deal with was that of a patient bleeding from an anastomotic ulcer at the site of a previous Billroth I type of partial gastrectomy (Case VI). Between November 19, 1954, and March 16, 1956, at Royal Prince Alfred Hospital there were only four deaths after partial gastrectomy. A total of 147 partial gastrectomies (mainly of the Pólya or Moynihan type) included 15 of the Billroth I type. In this period all the patients who died had had a Billroth I type of anastomosis.

With ulcers high up on the lesser curvature or on the posterior stomach wall, greater difficulty is experienced. If the ulcer is mobile, wedge excision and the usual type of partial gastrectomy will suffice (*i.e.*, removal of the stomach as far proximally as the lowest short gastric vessels on the greater curvature side, and as far as the first ascending branch of the left gastric artery on the lesser curvature side). Anastomosis in such cases can often be performed with a straight needle. However, partial gastrectomy above the ulcer or a Pauchet's type of partial gastrectomy is preferred. Figures II, III and IV show craters in ulcers of this type.

With large ulcers penetrating the pancreas, splenic artery area or posterior abdominal wall above the pancreas (*vide* Figure V), it is necessary to perform a much higher partial gastrectomy (in most such cases the anastomosis cannot be carried out with a straight needle) in order to approach proximally the area of the ulcer crater. This is often a difficult technical procedure, but there are a number of ways by which it may be made easier. It may be facilitated in the following ways.

1. The incision should be carefully planned according to the habitus of the patient. In some patients an oblique incision extending downwards and to the right from the tip of the eighth or ninth costal cartilage across the left hypochondrium and the epigastric region may be more suitable; in other patients of different configuration, a paramedian incision may be the more suitable. It should extend right up to (*usque ad*) the top of the angle between the xiphoid process, and the costal arch.

2. The patient should be postured so that he is turned partly on to the right side. This procedure, combined with an oblique incision, often gives comfortable access to the left cupola of the diaphragm and the structures related to it.

3. The left triangular ligament of the liver should be divided.

4. An early decision to remove the spleen should be made. Mobilization of the spleen gives easy access to the posterior wall of the stomach above the crater of almost all posterior penetrating gastric ulcers (Figure V). The lesser curvature side and the anatomy in the region of the left gastric artery are often very distorted from the pathological processes, cedema and cicatrization round the ulcer.

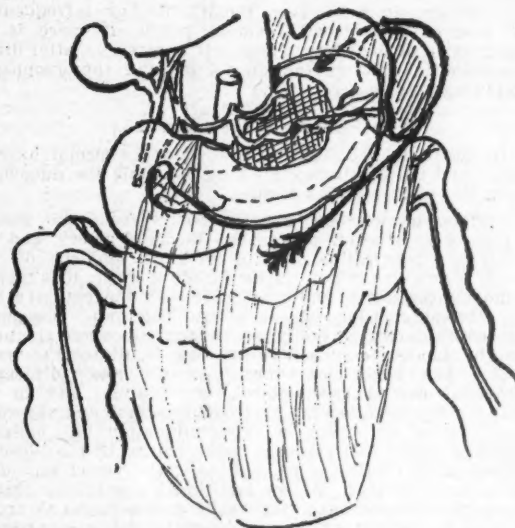


FIGURE V.

Diagram of a large saddle ulcer of the lesser curvature, indicating access to the posterior wall of the stomach above the crater made easy by mobilization of the spleen. (Portion of the anterior wall of the stomach cut away.)

5. It has long been the practice of many surgeons, at a very early stage in gastrectomy, to insert a piece of rubber tubing or gauze tape round the stomach near the pylorus. The assistant, by traction on this, can aid with mobilization of the stomach. A similar traction tape or fine rubber tube inserted from the greater curvature side above the spleen, behind the stomach and above the ulcer crater has frequently proved useful in mobilization of the posterior gastric wall from the structures which have been penetrated (Cases VI and VII).

6. If progress looks difficult after the duodenum has been divided and the stomach turned upwards to bring its posterior wall into view from the right, one should not hesitate to cut through the stomach wall at the most accessible point immediately adjacent to the edge of the ulcer, and (with one blade of the scissors within the stomach lumen and the other outside its peritoneal aspect) quickly to circumcize the ulcer base. This process of circumcizing the ulcer crater applies equally well to the anterior ulcer penetrating the liver, and to the occasional

huge saddle-shaped or dumb-bell-shaped ulcer of the lesser curve penetrating the liver in front and the posterior wall structures at the back. It is especially in these high, large, posterior ulcers and the dumb-bell and saddle ulcers that access to the posterior gastric wall round the greater curvature and above the ulcer (approached by mobilization of the spleen) may save a lot of difficult dissection (Case VII).

Attention to the foregoing points should make all ulcers operable without opening the chest as well as the abdomen. Such a combined procedure should be avoided in a patient in the midst of a severe hæmorrhage.

Though I have had a case of ruptured ulcer within a diaphragmatic hernia, I have had no case in which surgery was required for hæmorrhage from ulceration within the hernial sac. Most patients with the combination of diaphragmatic hernia and gastro-intestinal hæmorrhage prove to have the bleeding coming from an independent gastric or duodenal ulcer.

I believe that it is only in cases in which a very high partial gastrectomy is required that a dumping syndrome may occur despite proper execution of the partial gastrectomy. The so-called dumping syndrome following operation on the usual-sized gastric pouch is in most cases attributable to technical errors resulting in some incomplete obstruction of the efferent loop either by kinking or by rotation. It is, however, remarkable how infrequent it is, even with a small residual pouch, if there is no obstruction of the efferent loop. (It is rare, too, after direct anastomosis between the duodenum and the œsophagus following total gastrectomy.)

Duodenal Ulceration.

In duodenal ulceration, it is unusual for hæmorrhage to occur and require immediate surgery while the duodenum with the ulcer remains mobile.

Serious hæmorrhage usually occurs from the gastro-duodenal or superior pancreaticoduodenal artery, and the ulcer is a penetrating one. In the great majority of duodenal ulcers operated on in the bleeding phase, it is unwise (and unnecessary), and may jeopardize the patient's life, to attempt excision of the ulcer. The more reasonable procedure during severe hæmorrhage is to expose the ulcer site by duodenotomy, secure hæmostasis, divide the vessel which has bled, close the duodenum and perform a proximal partial gastrectomy; very rarely, and in the manner described later, a gastro-enterostomy and vagotomy may suffice if there is a combination of bleeding duodenal ulcer and stenosis. Mere suture of the bleeding vessel in continuity is not sufficient; the vessel should be completely divided. As an additional precaution against secondary hæmorrhage, the main gastro-duodenal artery should be ligated at its origin from the gastro-hepatic artery (Case V).

The second stated surgical principle (curing the ulcer or ensuring its healing) may be observed in the following ways.

1. Although excision of the ulcer or exclusion of its crater is the surgical method necessary to cure gastric ulcers, in most cases of duodenal ulcer (requiring surgery while bleeding), though these procedures are physiologically more desirable (and a common practice when bleeding is not occurring), they may be dangerous. Excessive vascularity, edema and the proximity of the common bile duct unnecessarily increase mortality and morbidity when excision of a difficult penetrating duodenal ulcer is carried out in a patient debilitated by serious bleeding.

2. In duodenal ulceration with bleeding, therefore, we must ensure healing by preventing the gastric juices, which are acid, from passing over the ulcer. If this is done the ulcer will heal.

3. This is effected by gastrectomy (Billroth II, Pólya or Moynihan type). The crater can sometimes be further protected by Yudin's method of closure of the duodenal stump (Tanner, 1950; Yudin, 1939).

Quite apart from the complication of hæmorrhage, the question as to whether a duodenal ulcer should be excised

or left *in situ* to heal after gastrectomy has often been one of difficult decision in the operating theatre and of controversy in the surgeons' room. It is evident that a great deal of the mortality rate of partial gastrectomy for duodenal ulcer is associated with deep penetration of the pancreas, and this especially obtains in ulcers of the second part of the duodenum (Marshall and Reinstine, 1957). Unless the duodenum is opened and the ulcer crater is seen or at least felt, the surgeon cannot possibly know the extent of the crater or be aware of encroachment on or penetration of the common bile duct. Furthermore, it seems likely that in a small percentage of cases there must be some communication between some smaller pancreatic duct and the ulcer base. It seems evident, therefore, that while ulcers of the first part of duodenum may be excised, no ulcer of the second part should be excised unless the duodenum is opened first and the extent of the crater is first seen or felt. In doubtful cases, when the ulcer is very close to the common bile duct, the ulcer should not be excised, but a proximal gastrectomy should be carried out.

4. Should the common bile duct be encroached upon or penetrated, or should the patient be jaundiced, the common bile duct should be emptied. A T-tube with a long limb should be introduced into the common bile duct and left there for three weeks or so. The large limb passes well down into the duodenal curve. Excision of the crater should again be avoided; this would of necessity involve reimplantation of the common bile duct.

5. If the rarely-to-be-adopted procedure of ligation of the bleeding vessel with gastro-enterostomy is carried out, the juices can be prevented from passing over the ulcer only by tying the duodenum in continuity proximally, or by invaginating the anterior wall of the duodenum on to the ulcer site by a series of invaginating sutures. In general this is not a very satisfactory procedure.

6. There may, too, be an occasional case (a patient with a phlegmon round a bleeding pyloric ulcer) in which the pylorus must be left at the initial laparotomy, an otherwise typical Pólya procedure being carried out and the pylorus being removed at a subsequent operation; however, a Bancroft procedure would be preferable if practicable.

Stomal Ulceration.

Stomal ulceration is illustrated by Cases VI and VIII.

Technical difficulties vary according to whether the condition follows gastro-enterostomy or partial gastrectomy (and whether this was Billroth I or Billroth II), according to whether the anastomosis has been ante-colic or retro-colic, and according to the adjacent structures or organs that are invaded. In general the management consists first in mobilization of the previous surgical field, and then in carrying out a higher partial gastrectomy of the Pólya or Moynihan type. It may be helpful to proceed through an oblique incision if the previous scar is vertical or vice versa (to circumvent adhesions to the parietal wound).

Here again, access to the stomach remnant above the spleen may allow a traction tape or clamp to be placed round or across the gastric remnant, to aid in mobilization of the stomach and ulcer. Reconstruction of the jejunum (prior to subsequent anastomosis) may be more easily carried out by leaving a small portion of the stomach attached to it, rather than the opposite. However, this may be impracticable, because often the ulcer is "round the corner" through the stoma in the jejunum, and may require a jejunal resection and anastomosis before the construction of the fresh gastro-jejunal anastomosis.

Great care must be taken to avoid injury to the blood supply of the transverse colon.

TYPE OF GASTRECTOMY TO BE EMPLOYED.

In a detailed analysis of 700 cases in which partial gastrectomy had been performed at Royal Prince Alfred Hospital (to be published shortly), the following observations were made.

Apart from the fact that mortality was greater after Billroth I than after Billroth II procedures, there could be

found no correlation between the type of Billroth II operative procedure adopted by 12 surgeons and the mortality or morbidity rate of the individual surgeon. Mortality and morbidity were highest among those surgeons who frequently changed the type of gastrectomy they used. It seems wise that a surgeon should vary his satisfactory technique as little as possible, though minor changes may be necessitated by differing pathological considerations.

My own preference is for an ante-colic anastomosis of the cut end of the stomach to the side of the proximal portion of the jejunum, and the afferent loop enters at the greater curvature. The efferent loop lies alongside the gall-bladder, and if the stomach is wide, I construct a valve, leaving a two-finger aperture. The efferent loop is sutured at two or three points to the remains of the lesser omentum; the efferent loop is thereby suspended, and its obstruction by kinking or rotation is prevented. The efferent loop is only long enough to be comfortably brought up to the gastric pouch at the greater curvature without tension. The duodeno-jejunal flexure is carefully inspected, and the ligament of Treitz is divided if it seems likely to cause obstruction of the afferent loop in the new position of the proximal part of the jejunum. I like the assistant to verify that it is in fact the proximal part of the jejunum, and not the terminal part of the ileum (Fisher, 1953), and the above-mentioned inspection of the suspensory ligament ensures this. Not only have anatomical anomalies of rotation been reported, but it is surprising how close at times are the duodeno-jejunal flexure and the ileo-caecal junction in many a patient with normal rotation of the gut.

The place of the Billroth I procedure has been already indicated.

The foregoing suggestions are based as follows: (i) Upon a personal series of 25 cases in which partial gastrectomy has been carried out during the bleeding phase (in three hospitals). (The only patient who died was one upon whom a "blind" gastrectomy had been performed, and *post mortem* it was found that he had a thoracic aortic aneurysm leaking into his oesophagus.) (ii) Upon a detailed analysis of 700 partial gastrectomies performed by 12 surgeons at Royal Prince Alfred Hospital, including 110 in which they had performed operation during the bleeding phase. In this 110 are included 18 of my own series of 25 patients.

REPORTS OF CASES.

CASE I.—A female patient, aged 40 years, had a large chronic gastric ulcer penetrating the liver. She was admitted to a country hospital on July 19, 1955, with a history of nausea, weakness, breathlessness on exertion and loss of energy, with some looseness of bowels and some nausea for the preceding 12 weeks. She had no complaint of indigestion. After her admission to hospital the patient was found to be having a melæna, and the passage of melæna stools continued without variation three or four times daily over the following ten days. Her hæmoglobin value was 19% (2.8 grammes per centum). A blood transfusion was given, and despite hospital care, bed rest and blood transfusion the melæna continued. X-ray examination with a barium meal revealed an ulcer with deformity of the lesser curvature and anterior wall penetrating the liver. Laparotomy was performed on August 2, 1955, and revealed a large ulcer of the lesser curvature and anterior gastric wall; it had penetrated the liver and left a crater two inches in diameter and approximately circular in outline. There was no duodenal ulcer. Partial gastrectomy of the anterior Polya type (proximal loop to greater curvature) was performed, and convalescence was normal.

CASE II.—A female patient had a chronic ulcer of the first part of the duodenum penetrating the gall-bladder (see Figures VI and VII). She had been treated for many months for neurasthenia till melæna occurred, although she persisted in complaining of epigastric pains. A barium meal X-ray examination had revealed no abnormality, and the gall-bladder was reported on as normal after cholecystography. She was admitted to a suburban hospital, and a further radiological examination was made with a barium meal. This revealed some widening of the duodenal curve, which was thought possibly to be due to neoplasm or to a cyst of the head of the pancreas. A cholecystogram was normal. At laparotomy, a penetrating ulcer of the duodenum was found at the junction of the first and second parts. The fundus of the gall-bladder formed the ulcer crater, though perforation of the gall-bladder had not occurred.

CASE III.—A male patient, aged 57 years, was admitted to hospital on December 25, 1951, with a history of hæmatemesis and melæna of two days' duration, after five years' indigestion, which resulted in pain and backache of sufficient severity to waken him frequently at night. Copious bleeding continued after his admission to hospital and blood transfusion. At that time his systolic blood pressure was 70 millimetres of mercury, and the diastolic pressure was not recordable. On the next day laparotomy was performed, and no ulcer was found. From the subsequent course, however, it is considered that an ulcer in the second part of the duodenum must have been overlooked. A "blind" gastrectomy was performed. After operation the patient remained reasonably well for four days, when he had a moderately large melæna which did not greatly affect his general condition. This was repeated on the following day. He was discharged from hospital, "reasonably well", on January 26, 1952.

On May 16, 1952—i.e., about four months later—he was readmitted to hospital with jaundice and a history of passing dark urine and pale stools for three weeks. He had in the meantime had a good deal of epigastric pain, but no vomiting. After investigations which indicated the presence of obstructive jaundice, laparotomy was performed. The pancreatic head was stony hard (no biopsy was taken), there were soft glandular enlargements, and the gall-bladder was very dilated. It was considered that the patient had either a carcinoma of the head of the pancreas or chronic pancreatitis. Anastomosis was carried out between the enlarged gall-bladder and the efferent loop which lay alongside it.

He was examined again three and a half years later, on February 8, 1956, when he had an attack of upper abdominal pain which settled immediately on his admission to hospital. Barium meal X-ray and follow-through examination revealed a normally functioning stoma after partial gastrectomy. Some residual barium in the right hypochondrium was probably in the gall-bladder. However, no tests of pancreatic function were carried out. The patient seemed very well after a few days' observation, and was allowed home.

CASE IV.—A male patient, aged 43 years, had a chronic ulcer of the second part of the duodenum. At operation at Royal Prince Alfred Hospital on July 16, 1956, a partial gastrectomy was carried out for a penetrating duodenal ulcer with recurring melæna. Acute pancreatitis developed on the fourth day after the operation. The serum amylase estimation produced a figure of 800 milligrammes per 100 millilitres (glucose), indicated by constant pain in the left lumbar region, stabbing and sharp in nature. The symptoms settled rapidly, and the patient was discharged from hospital on July 31, 1956. He was readmitted on August 13, and remained in hospital till December 15, 1956. The serum amylase estimation varied from 3000 to 1500 milligrammes per 100 millilitres (glucose).² There was no adequate response to resting of the upper part of the intestinal tract by continuous suction and the administration of antibiotics and belladonna. After careful consideration and observation of the patient by the gastro-enterological unit, laparotomy was carried out, with splenectomy and excision of all the pancreas to the left of the mesenteric vessels, which was extremely hard (the head was soft by palpation). No dilated duct was seen on careful examination of sections of the pancreas, so that pancreatico-jejunostomy was not practicable. The serum amylase estimation gradually settled to 130 milligrammes per 100 millilitres (glucose) immediately prior to the patient's discharge from hospital.

CASE V.—A male patient, aged 65 years, was admitted to Royal Prince Alfred Hospital on February 27, 1957, having been transferred from a country hospital with a history of repeated hæmatemeses over the preceding four days, recurrent despite treatment in hospital and blood transfusion. Laparotomy and duodenotomy revealed a large posterior penetrating duodenal ulcer about three-quarters of an inch in diameter, with a large spurting artery in the base, thought to be the gastro-duodenal or superior pancreatico-duodenal artery. This artery was oversewn in continuity with a number of chromicized sutures, and the duodenum was closed. A proximal partial gastrectomy was carried out. On March 6 the patient was well, up and about and taking food satisfactorily. He was transferred back to the country hospital to complete his convalescence.

He was readmitted to Royal Prince Alfred Hospital on March 23, having had a further hæmatemesis on March 11; he continued to have hæmatemeses and melæna till on March 28 a further laparotomy was performed. The duodenal stump was reopened; no healing was apparent in the ulcer crater. A secondary hæmorrhage had occurred (and was taking place) from the same vessel as previously. After the insertion

² Starch-iodine method of Somogyi (1938).

TABLE I.
Personal Series of 25 Cases.¹

Case Number.	Sex.	Age. (Years.)	Site and Type of Ulcer.	Operation Performed.	Ulcer Excised or Not.	Days in Hospital after Operation.	Complications.
I	F.	53	Duodenal ulcer.	Anterior Pólya.	Yes.	16	Later developed anastomotic ulcer which bled.
II	M.	57	Duodenal ulcer, second part.	Anterior Pólya.	No.	30	Chronic pancreatitis and late obstructive jaundice.
III	M.	38	Duodenal ulcer, second part.	Anterior Pólya.	No.	7; then transferred.	
IV	F.	60	Multiple erosions.	A.P.H. ²	Yes.	51	Further gastro-intestinal bleeding after resection.
V	M.	28	Duodenal ulcer, first part.	A.P.H.	Yes.	30	Acute pancreatitis necessitating second laparotomy and drainage of peritoneal cavity.
VI	M.	50	Duodenal ulcer, first part.	A.P.H.	No.	19	
VII	M.	65	Gastric ulcer, posterior crater 14 inches by 14 inches.	A.P.H. with splenectomy.	Yes.	14	
VIII	M.	54	Stomal ulcer after Billroth II gastrectomy.	A.P.H.	Yes.	90	Empyema, necessitating rib resection and drainage.
IX	M.	42	Gastric ulcer.	A.P.H.	Yes.	Transferred.	No complication due to surgery (hemolytic anemia). Died later same night.
X	M.	65	Leaking thoracic aneurysm.	Blind A.P.H.	Not applicable.	—	
XI	F.	38	Ring carcinoma of duodenum.	A.P.H.	No.	23	Later developed liver metastases and died.
XII	F.	36	Large gastric ulcer.	A.P.H.	Yes.	12	
XIII	F.	55	Anastomotic jejuna.	A.P.H. with splenectomy.	Yes.	40	
XIV	M.	24	Duodenal ulcer and cirrhosis of liver.	A.P.H.	No.	24	
XV	F.	—	Gastric ulcer perforating splenic artery.	A.P.H. with splenectomy.	Yes.	17	
XVI	M.	65	Duodenal ulcer, second part.	A.P.H.	No.	9	Readmitted with secondary hemorrhage.
XVII	F.	31	Gastric ulcer, high and large.	Pauchet with splenectomy.	Yes.	18	
XVIII	M.	33	Duodenal ulcer, first part.	A.P.H.	Yes.	23	
XIX	M.	69	Prepyloric ulcer.	A.P.H.	Yes.	17	
XX	M.	23	Duodenal ulcer, first part, and cholelithiasis with acholic jaundice.	A.P.H. with splenectomy and cholecystectomy.	Yes.	26	Mild; dumping syndrome.
XXI	F.	45	Gastric ulcer penetrating liver.	A.P.H.	Yes.	12	
XXII	F.	31	Anastomotic ulcer after Billroth I operation.	Pauchet with splenectomy.	Yes.	13	
XXIII	F.	32	Gastric ulcer, large and high.	Splenectomy with A.P.H.	Yes.	13	
XXIV	M.	45	Duodenal ulcer, second part.	A.P.H.	No.	24	
XXV	F.	45	Prepyloric ulcer penetrating gall-bladder.	A.P.H.	Yes.	26	

¹ Summary: Ten duodenal ulcers, one error in diagnosis (patient died), three anastomotic ulcers, one carcinoma of the duodenum, eight gastric ulcers.

² "A.P.H."—anterior Pólya-Hofmeister anastomosis, proximal loop to greater curvature.

of further paired sutures on either side of the bleeding point, the vessel was completely divided. The duodenal stump was closed. The gastro-duodenal artery was then ligated and divided at its origin from the gastro-hepatic artery, and a large vessel (probably the inferior pancreaticoduodenal artery), approaching the ulcer site from below, was treated in a similar manner. Convalescence was thereafter unimpeded, and the patient was discharged from hospital on April 22.

CASE VI.—A female patient, aged 31 years, was admitted to a country hospital on April 25, 1957, with hæmatemesis and melæna. She gave a history of having undergone a previous partial gastrectomy for ulcer at another hospital, after which she was told that it would be impossible for her to have another ulcer, because there was not sufficient stomach left behind. The operation had been performed through an oblique upper abdominal incision, which had been sutured with wire. At a subsequent procedure some of the wire had been removed, and the patient had a fair-sized incisional hernia. After her admission to hospital, and despite blood transfusion and bed rest, she had three hæmatemeses, each of about two pints. She was examined in consultation on May 3 and operation was advised, but the patient refused. Further hæmatemesis occurred on May 3 and 4, and the patient consented to operation on May 5.

At operation a large ulcer was found high up on the lesser curvature, at the site of a Billroth I anastomosis. The ulcer crater was slightly oval and about 1.5 inches in diameter, and the base was formed by aorta and diaphragm. Bleeding was occurring from a large branch of the left gastric artery. The spleen had not been removed at the first operation. The approach along the lesser curvature was difficult. The spleen was mobilized, and the posterior gastric wall above the crater was approached round the greater curvature (above the mobilized spleen). It was possible to insert a traction rubber from this aspect, which emerged on the lesser curvature side at the cardio-oesophageal junction. The ulcer crater was then circumcized with scissors, and higher (subtotal) partial gastrectomy and splenectomy of the Pauchet type were performed, but with the proximal part of the jejunum united to the greater curvature side.

The patient was discharged from hospital on May 19, the fourteenth day after operation.

CASE VII.—A female patient, aged 28 years, was admitted to Royal Prince Alfred Hospital at 5.30 a.m. on August 22, 1956. The first bleeding episode had occurred at 4 a.m., when she vomited one and a half chamber-potfuls of blood. She had a five-year history of gastric ulcer. Her blood pressure at 6 a.m. was 80/60 millimetres of mercury. It fell to 50/0 millimetres of mercury at 6.30 a.m., and after blood transfusion at 11 a.m. it was 115/70 millimetres of mercury. At 1 p.m. she had a hæmatemesis, vomiting 26 ounces. Further hæmatemesis and melæna occurred on the operating table as the anæsthetic was commenced. A previous X-ray report was as follows: "There is a very large ulcer crater on the posterior wall at junction of middle and upper third with some narrowing of the stomach at the site."

At operation, acute dilatation of the stomach and bowel with blood was found. There was a large anterior oval gastric ulcer, measuring 2.4 by 1.6 inches, penetrating the liver. A large posterior oval penetrating gastric ulcer was also present; it had eroded the pancreas and the posterior abdominal wall above it, and the crater measured 2.9 by 1.6 inches. There was also a large perforation of the splenic artery, which was spurting blood. High subtotal gastrectomy with splenectomy was performed, and surgery to the splenic artery at the site of the rupture. Access to the posterior abdominal wall above the crater was gained by early mobilization of the spleen. The stomach was cut with scissors, first the anterior ulcer and then the posterior ulcer being circumcized. Suture and division of the bleeding splenic artery were carried out. An anterior Pólya anastomosis (proximal part of the jejunum to the greater curvature) was performed after reduction of the size of the stomach by Pauchet's type of procedure. Five bottles of blood were given during the procedure. The systolic blood pressure at the termination of the operation was 130 millimetres of mercury. The abdomen was closed, with peritoneal drainage. A drainage tube was inserted down to the site of the posterior ulcer. The patient's progress was uncomplicated. The abdominal drainage tube was removed after 36

hours. The patient was discharged from hospital on September 9. The duration of her stay in hospital was 18 days.

CASE VIII.—This patient (not a patient of mine) was a man, aged 52 years, who was admitted to Royal Prince Alfred Hospital with a large penetrating gastric ulcer about three inches in diameter. He had been suffering from severe hæmatemesis. Despite multiple blood transfusions his condition deteriorated, and immediate operation was performed. A large gastric ulcer was found, and in view of his poor condition the ulcer was removed from its bed and the bleeding point (splenic artery) oversewn; this was followed by closure of the stomach, and nothing further was attempted. In the post-operative period he collapsed and laparotomy was performed. A severe hæmorrhage from the ulcer bed was found and stopped. Partial gastrectomy was performed.

SUMMARY.

1. Certain pathological and physiological features of bleeding ulcers are described.
2. It is shown that in dealing with a bleeding point, suture in continuity may not suffice.
3. Surgical principles in operating on ulcers during the bleeding phase are defined.
4. Certain aspects of surgical technique are discussed in relation to gastric, duodenal and anastomotic ulcers.
5. A number of illustrative case histories are given.

REFERENCES.

- FISHER, E. M. (1953), "Inadvertent Gastro-Ileostomy in the Presence of Left-Sided Caecum", *Australian & New Zealand J. Surg.*, 23: 156.
- MAINGOT, R. (1948), "Abdominal Surgery", 2nd Edition, Appleton-Century-Crofts, New York.
- MARSHALL, S. F. (1956), "Partial Gastrectomy for Peptic Ulcer", *S. Clin. North America*, June: 670.
- MARSHALL, S. F., and O'DONNELL, B. (1957), "Gastroileostomy, a Preventible Surgical Error", *S. Clin. North America*, June: 665.
- MARSHALL, S. F., and REINSTINE, H. W., JUNIOR (1957), "An Analysis of Mortality following Gastric Surgery", *S. Clin. North America*, June: 637.
- SOMOGYI, M. (1938), "Micro Methods for the Estimation of Diastase", *J. Biol. Chem.*, 125: 414.
- TANNER, N. C. (1950), in "Techniques in British Surgery", edited by Maingot, R., Saunders: 408.

Reports of Cases.

RUPTURED ABDOMINAL ANEURYSM TREATED SUCCESSFULLY BY EXCISION AND HOMOGRAFTING.

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As a result of the successful resection of an abdominal aneurysm and replacement by homograft, by Charles Dubost, of Paris, in 1951, this form of treatment has been firmly established. Prior to this, for many years, surgeons had tried various attacks, using wire, "Cellophane" etc., but with no lasting results. However, all such treatments have now been abandoned.

Today the major controversy lies between homograft and plastic graft. At the present date, no universal agreement has been reached as to which is best.

Sharp (1955) and Susman (1955) reported the first successful cases of excision of an abdominal aorta in Australia.

Clinical Record.

Mrs. A., aged 56 years, was admitted to hospital at 12.25 p.m. on November 13, 1956. She gave a history that five hours previously, while in bed, she was seized with severe abdominal pain. Her local doctor was called in, and having made the diagnosis of ruptured abdominal aneurysm, administered morphine and transferred her to

hospital. On her admission to Royal Prince Alfred Hospital, the patient was pale and slightly confused. There was a large pulsating mass in the abdomen, somewhat fusiform in shape and extending into the right iliac fossa. It was extremely tender. Her pulse rate was 98 per minute, and her blood pressure was 60/45 millimetres of mercury. Both femoral arteries were palpable. The patient insisted that she had not previously noticed any mass in her abdomen.

Immediate blood transfusion was commenced, and after one pint of blood had been given the blood pressure rose to 90/60 millimetres of mercury. Operation was advised and was commenced at 4 p.m., three bottles of blood having been previously administered. The anaesthetic was administered by Dr. W. R. M. Shaw.

A mid-line incision was made from the xiphisternum to the pubes. There was a large aneurysm of the abdominal aorta and also of both common iliac arteries, especially the right. A large amount of recent blood clot was present extending extraperitoneally around the caecum and in the root of the mesentery.

Clamps were applied to the aorta, immediately above the aneurysm (which was below the renal artery), and to the left common iliac artery and across the origin of the right external and internal iliac arteries below. These clamps having been applied, the aneurysm was opened and evacuated, the inferior mesenteric vein and artery being divided. As much of the aneurysm as possible was removed, but some was left on the inferior vena cava, on the vertebral column posteriorly and in the pelvis. A preserved homograft was then placed *in situ*, anastomosing to the common iliac artery on the left and the external iliac artery on the right, the right internal iliac being sacrificed.

There was a little troublesome bleeding around the aortic anastomosis, but good pulsation was present, particularly in the left common iliacs below the anastomosis. Penicillin and streptomycin powder was placed around the graft, and the abdominal wound was repaired.

The patient's blood pressure at the commencement of the operation was 130/95 millimetres of mercury, and at the end 100/50 millimetres of mercury. Six and a half bottles of blood were given during the operation, which lasted two and a half hours. The actual period during which the abdominal aorta was clamped was one hour and fifteen minutes.

Next day it was obvious that the right femoral artery had no pulsation, and the leg below the knee was extremely cold. However, in the left leg excellent pulsation was evident in all vessels. Gangrene of the right lower limb ensued, and the leg was amputated from the mid-thigh on November 21. Some difficulty was encountered with the healing of the amputation stump, which required re-trimming of skin edges on December 13. The patient was allowed out of bed on December 14, and was discharged from hospital on January 18, 1957. Since that time she has managed fairly well on crutches. Good pulsation is present in the *dorsalis pedis* artery of the left foot, and she is well pleased with life.

Comment.

The rupture of an abdominal aneurysm is often a sinister catastrophe taking place over several days. In fact, the pain which usually accompanies aneurysm is due in some cases to small leaks. It is this somewhat subacute process (unlike that of thoracic aneurysm) which allows effective treatment to be instituted. In the text-books little stress has been made of the fact that roughly some 60% of patients with abdominal aneurysm die as a result of rupture (Estes, 1950; Neron, 1911).

Cooley (1956) showed that of 17 patients with ruptured abdominal aneurysm treated by excision, 11 survived. From these figures it appears obvious that direct attack in these cases, although dangerous, does give the patient a reasonable chance of recovery.

The present case impressed on us the need for early dissection and clamping of the proximal aorta to control the hæmorrhage. Whereas when no rupture has occurred

an attempt may be made to dissect the aneurysm free before clamping the aorta, this procedure is too time-consuming in cases of rupture.

Cooley (1956) states that it is useless to attempt to combat shock in such cases by massive transfusion, until this proximal occluding clamp is applied.

From the literature it appears that in the absence of rupture, obstruction to the iliac or femoral artery below the lower anastomosis (leading to gangrene of part or whole of the leg) is a definite danger. Whether this obstruction is due to an embolus dislodged prior to or during surgery, or whether it is due to stasis and thrombosis during the operation, is not known. Farrar *et alii* (1956) had one case out of two in which amputation of the leg was necessary. King and Schumacker (1955) reported thrombosis of the distal vessels in three cases out of five. The same authors have collected some 35 cases of ruptured abdominal aneurysm treated by excision, with a survival of 21.

Summary.

A case of ruptured abdominal aneurysm treated surgically with a successful outcome is reported. A brief résumé of the literature indicates that, although the mortality is greater than in unruptured aneurysm, successful surgical management of the ruptured aneurysm is possible. The high incidence of limb gangrene in such cases is also recorded.

References.

- COOLEY, D. (1956), "Aneurysm of the Abdominal Aorta: One Hundred and One Cases Treated by Excision", "International Symposium on Cardiovascular Surgery", Ford Hospital: 448.
- ESTES, J. E., JUNIOR (1950), "Abdominal Aortic Aneurysm: A Study of One Hundred and Two Cases", *Circulation*, 2: 258.
- FARRAR, T., *et alii* (1956), "Surgical Treatment of Acute Rupture of Abdominal Aneurysms: Report of Two Cases", *Proc. Staff Meet., Mayo Clin.*, 31: 229.
- KING, H., and SCHUMACKER, H. B., JUNIOR (1955), "Surgical Treatment of Ruptured Aortic Aneurysms", *Arch. Surg.*, 71: 768.
- NBROUN, J. A. (1911), "Abdominal Aortic Aneurysm in a Girl, Age 20, due to Congenital Syphilis, with Tables of Collected Cases of Abdominal Aneurysm", *St. Barth. Hosp. Rep.*, 47: 43.
- SHARP, A. (1955), "Abdominal Aortic Aneurysm: Resection of Bifurcation and Homografting (with Hypothermia)", *M. J. AUSTRALIA*, 2: 125.
- SUSMAN, M. P. (1955), "Aortic Grafting for Abdominal Aneurysm", *M. J. AUSTRALIA*, 2: 128.

PERFORATED GASTRIC ULCER DURING PREDNISOLONE THERAPY.

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It is now well known that the newer cortisone derivatives, prednisone and prednisolone, can cause acute dyspeptic symptoms and even peptic ulceration. Most reported cases have been of duodenal ulcers. Bollett *et alii* (1955) reported three cases of duodenal ulceration developing in 18 patients receiving prednisone or prednisolone therapy. They were detected by serial barium meal X-ray examinations, and the patients were symptomless.

The following case report illustrates an unusual perforation, during prednisolone therapy of a gastric ulcer situated near the greater curvature; the perforation occurred into the lower compartment of the greater peritoneal sac.

Clinical Record.

A single woman, aged 35 years, was admitted to the Central Middlesex Hospital on February 14, 1956. She gave a history of having been awakened during the night, 14 hours before her admission, by severe acute pain around the umbilicus. This pain had increased in severity.

Vomiting of dark, bile-stained fluid had occurred four times. A mild attack of four hours' duration had occurred two weeks before. She gave a history of vague epigastric discomfort present for about one year, sometimes aggravated by food; but this had not been severe enough for her to seek treatment. Further inquiry revealed that she had been under treatment at another hospital for uveitis for one year, with various forms of cortisone given orally and injections. At the time of her admission to hospital she was taking prednisolone tablets.

On examination of the patient, she was found to have a temperature of 100.6° F. Her pulse rate was 116 per minute and her systolic blood pressure 140 millimetres of mercury. She was not shocked. A definite moon-shaped appearance of her face was obvious. The upper part of the abdomen moved freely with respiration. There was moderate generalized tenderness with guarding maximal in the right iliac fossa, but no marked rigidity was found. Rectal examination revealed tenderness in the pouch of Douglas. A diagnosis of peritonitis was made. Operation was performed three hours after her admission to hospital, preceded by the intravenous administration of saline and by gastric suction through a Ryle's tube, which produced 10 ounces of bile-stained fluid. A right paramedian incision was made. No free fluid was present in front of or above the greater omentum. On displacing the omentum, purulent fluid was aspirated from the greater sac of peritoneum below the transverse mesocolon and omentum. The pelvis contained much purulent fluid, but the pelvic viscera were clear, as were the appendix and sigmoid colon. An area of induration was palpated behind the greater curvature of the stomach towards its pyloric end. This proved to be an abscess involving the right surface of the root of the mesentery, the inferior surface of the adjacent mesocolon and adjacent loops of small bowel. When this abscess was opened, a finger could be passed upwards through a hole in the mesocolon directly into the lumen of the stomach through a perforated ulcer about three quarters of an inch in diameter, which was situated on the posterior surface of the stomach near the distal part of the great curvature. The ulcer had perforated through the mesocolon. The lesser peritoneal sac had been obliterated by adhesions. The lesser sac was opened anteriorly below the greater curvature a little distance from the ulcer, and the margins of the ulcer were separated from the hole in the mesocolon with blunt finger dissection. There was only slight induration in the edge of the ulcer, and it was closed readily with interrupted catgut sutures and an overlying layer of interrupted Lambert silk sutures, and covered over with omentum. The hole in the transverse mesocolon was closed with interrupted catgut sutures. The abdominal wall was closed in layers without drainage.

Convalescence was uneventful. The wound healed well, and the patient was discharged from hospital on the fifteenth day after operation; no cortisone was given.

A barium meal X-ray examination in March, 1956, showed normal appearances of the stomach. There was no evidence of peptic ulceration, and emptying was normal.

The actual details of previous therapy subsequently ascertained were as follows: The patient had been admitted to Guy's Hospital on April 16, 1955, for uveitis. She was given 30 units of ACTH per day intravenously for 12 days, and then 30 units on alternate days for eight days. There was no improvement. The dose was increased to 30 units on alternate days and 20 units of ACTH gel. She was discharged from hospital on a dosage of 30 units of ACTH gel every other day by intramuscular injection. The condition recurred. She was then admitted to New Cross General Hospital, and given ACTH gel intramuscularly in a dosage of 30 units per day. The uveitis was controlled and she was discharged from hospital. In November she was receiving ACTH gel, 20 units and 30 units on alternate days; this was the minimum dosage required to control inflammation. In January, 1956, the treatment was changed to dexamethasone in a dosage of 25 milligrammes per day. When she was last examined in the eye clinic on February 3, 1956, both eyes were quiet and the dosage of dexamethasone was reduced to 15 milligrammes per day, to see whether this would control the condition. She was

complaining of slight periodic abdominal discomfort; but examination of the abdomen at that time revealed no tenderness, and there was no localized rigidity. In addition to the local treatment, she had been having cortisone eye drops every two hours, and hydrocortisone ointment applied to the eye at night.

Discussion.

Bunim *et alii* (1955), Marjolis *et alii* (1955) and Fisher (1956) all refer to the relatively high incidence of dyspepsia during prednisolone and prednisone therapy. Recent reports of perforation of a peptic ulcer during such therapy all refer to duodenal ulceration.

Kellock *et alii* (1957) recently reported a fatal case of symptomless perforation of a duodenal ulcer during treatment of multiple myeloma with prednisone. Pickert (1956) also reported a fatal case of symptomless perforation of a duodenal ulcer during treatment of scleroderma.

Hess *et alii* (1957) and Fentress *et alii* (1956) both reported the cases of female patients who developed perforation of duodenal ulcers during prednisolone therapy for rheumatoid arthritis. Both patients developed typical symptoms of acute perforation, and both recovered after suture of the perforation. Both patients were given prednisone and prednisolone therapy in the post-operative stages.

In the case reported here, at no time did the patient show signs of collapse due to sudden withdrawal of the prednisolone, and yet her recovery was uneventful. This may have been due to the fact that she had been receiving the prednisolone for only one month before the perforation. In most reported cases the therapy has been in progress for a much longer period.

Bollett *et alii* (1955) in their discussion concluded that the longer prednisolone therapy was continued, the more likelihood there was of ulceration.

In the case reported here, the patient showed few symptoms suggestive of acute perforation. This fact may be attributed in part to the preceding prednisolone therapy, but also to the anatomical features. The subphrenic spaces and upper compartment of the greater peritoneal sac were completely free from inflammatory exudate. This may account for the absence of rigidity, the normal respiration and the relative comfort of the patient.

The lesser sac was not involved, as the posterior surface of the stomach at the site of the ulcer was adherent to the transverse mesocolon. This is the normal state of affairs; in most subjects during gastrectomy their "physiological" adhesions require separation to protect the mid-colic vessels.

Summary.

A case of perforated peptic ulcer during prednisolone therapy is reported. The case is unusual in the fact that it was a gastric ulcer, situated near the greater curvature, the subsequent peritonitis was confined to the lower part of the abdomen, and the post-operative period was uneventful despite sudden withdrawal of prednisolone therapy.

Acknowledgement.

I wish to thank Mr. T. G. I. James, Senior Surgeon, Central Middlesex Hospital, for his assistance in the preparation of this article.

References.

- BOLLETT, A. J., BLACK, R., and BUNIM, J. J. (1955), "Major Undesirable Side-effects Resulting from Prednisolone and Prednisone", *J.A.M.A.*, 158: 459.
- BUNIM, J. J., PICHET, M. M., and BOLLETT, A. J. (1955), "Studies on Metacortandralone and Metacortandracin in Rheumatoid Arthritis. Antirheumatic Potency, Metabolic Effects and Hormonal Properties", *J.A.M.A.*, 157: 311.
- FENTRESS, V., FIRNSCHILD, P., and REVENO, W. S. (1956), "Perforated Duodenal Ulcer Complicating Prednisone Therapy", *New England J. Med.*, 254: 657.
- FISHER, M. (1956), "Hydrocortisone Versus Prednisolone in Rheumatoid Arthritis", *Lancet*, 2: 18.
- HESS, E. V., and MCPHERSON, M. E. (1957), "Perforated Duodenal Ulcer Complicating Prednisolone Therapy", *Brit. M. J.*, 1: 271.
- KELLOCK, I. A., and SCLABE, G. (1957), "Fatal Duodenal Perforation during Prednisone Therapy", *Brit. M. J.*, 1: 930.
- MARJOLIS, H. M., HARR, J. H., junior, STOLZER, E. L., and EISENBERG, C. H., junior (1955), "Effects of Prednisone (Meticorten) on Manifestations of Rheumatoid Arthritis—Report of Early Clinical Observations", *J.A.M.A.*, 158: 454.

A CASE OF MESENCHYMOMA.

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MESENCHYMOMA may be defined as a neoplasm composed of an admixture of two or more non-epithelial mesenchymal derivatives that ordinarily are not found together in a single tumour (Stout, 1948). It is now recognized by most pathologists as a distinct tumour entity. Some authorities, however, do not accept the condition as a real entity (Boyd, 1955).

The interest in the present case lies in (a) the site of the tumour, (b) the difficulty in diagnosis and (c) the apparent association of the tumour with the patient's blood pressure. A number of similar tumours have been reported, arising in the neck, back, abdominal wall, buttocks, thigh, tibia, lung, liver and uterus (Gilmour, 1943; Gilmour, 1948; Symmers and Nangle, 1951; Pack and Lisa, 1954; Alzner, 1955). Some have been cured by surgery, some have recurred and some have metastasized. Many have progressed to a fatal termination. These tumours vary greatly in size and may reach over a foot in diameter. Apparently no relation to blood pressure has been reported.

Clinical Record.

Mrs. A., aged 22 years, presented in August, 1951, having had her last normal menstrual period on June 20, the expected date of confinement being March 30, 1952. It was her first pregnancy. Her weight was 13 stone and her urine was normal. Her blood pressure was 138/90 millimetres of mercury, and it rose progressively to 164/104 millimetres of mercury at 22 weeks, and to 170/120 millimetres of mercury at 35 weeks, when her urine contained no albumin. By 36 weeks her blood pressure was down to 160/110 millimetres of mercury, but her urine contained a faint cloud of albumin; two days later the blood pressure was 180/120 millimetres of mercury, but her urine contained a cloud of albumin. Surgical induction of labour on March 2 resulted in the delivery of a male infant weighing five pounds five ounces. By May 24 her blood pressure was still 150/100 millimetres of mercury, but her urine was normal. Vaginal examination revealed no abnormality.

By August 26, 1952, having had no menstrual periods, she was again 18 to 20 weeks pregnant; her blood pressure was 170/100 millimetres of mercury and her urine was clear. By December 9, with the fundus being at the 33 weeks' level, her blood pressure was 170/120 millimetres of mercury and her urine was clear. A surgical induction of labour was performed, and she was again delivered of a small male infant. By March 2, 1953, her blood pressure had settled to 145/100 millimetres of mercury.

On July 21, 1953, she was again eight weeks pregnant, her blood pressure being 160/110 millimetres of mercury, and after consultation with a physician her pregnancy was terminated. It was then found that she had a firm, slightly mobile swelling about two inches in diameter in the right antero-lateral fornix behind the right superior ramus of the pubis; it was apparently not attached to the uterus and was not tender.

She was reexamined on October 6, 1954, and on December 22, 1954, and the mass was still present and found to be very hard, but not tender. There appeared to be no variation in size from the previous examination. Operation was advised and refused by the patient.

She was next examined in July, 1955, when she had spots before the eyes and swelling of the hands and feet, and was unable to talk to people. The urine contained no albumin. Her blood pressure was 180/110 millimetres of mercury and

the pelvic mass was unaltered. She was not examined again until August, 1956, when her blood pressure was still 170/110 millimetres of mercury and she agreed to operation.

Operation was performed in September, 1956. Through the abdomen a hard extraperitoneal tumour, two and a half inches in diameter and anterior to the broad ligament, was removed with difficulty. It appeared to be attached to the pubic ramus and femoral canal, a root of the tumour descending into the canal. A femoral approach was made and the root of the tumour was removed. It was found to be in close contact with a large vein, which was thrombosed. About half an inch of the vein was removed with the root of the tumour.

suggested, on the evidence that the blood pressure, which had fallen to near its original level after two severely hypertensive pregnancies, again rose steeply about the time when the tumour was detected. It fell to lower than its original level after removal of the newgrowth. The treatment of choice for these tumours would appear to be a wide surgical excision.

Acknowledgements.

We are indebted to Professor C. V. Harrison, of the University of London, and to Dr. A. A. Palmer and Dr. E. Hirst, of Sydney Hospital, for their help in elucidating this tumour, and to Mr. R. Peir, of the St. George Hospital, for the photographs. Our thanks are due to Dr. D. J. Wurth

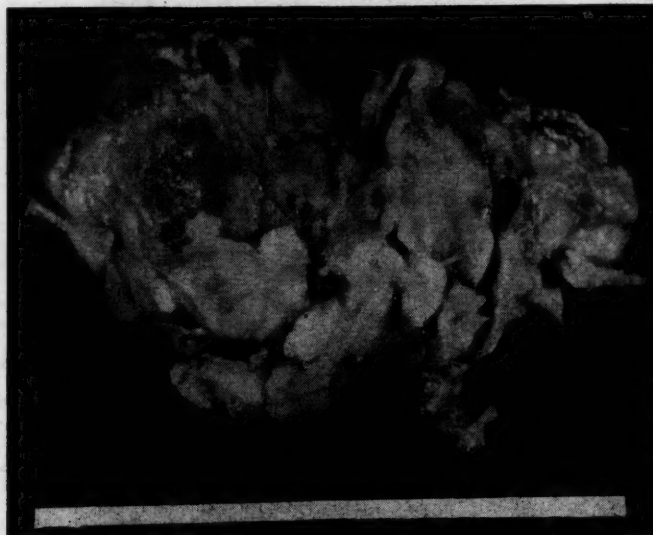


FIGURE I.

Tumour natural size; lateral outer surface. White line is 3.5 inches long.

The patient was examined on October 16, a month after the removal of the tumour; no abnormality was detected, and her blood pressure was 140/84 millimetres of mercury. On March 18, 1957, her blood pressure was 140/80 millimetres of mercury.

Macroscopic Appearance of the Tumour.

The tumour was an irregular mass with a smooth surface, but no distinct capsule. It measured approximately 3.5 by 2.5 by 1.0 inches. The cut surface had a variegated appearance of fatty, hæmorrhagic and cartilagenous areas (Figures I and II). It was of rubbery consistency. Some small fragments of tumour, the largest measuring one inch in diameter and associated with a thrombosed vein, were received separately.

Microscopic Appearance of the Tumour.

The tumour was composed of mixed tissue of angioendotheliomatous (Figures IIIa and IIIb), fatty, fibrous, fibro-sarcomatous (Figures IV and V) and myxomatous appearance (Figure VI). Scattered inflammatory cells and cells of doubtful origin, possibly hæmatopoietic, were also present. Mitotic figures were infrequent.

Progress of the Patient.

There has been no further development, and the patient remains well. The ultimate prognosis is doubtful.

Discussion.

A case of a mixed tumour, apparently arising from primitive connective tissue and giving rise to fat and to fibro-vascular, myxomatous and possibly hæmatopoietic tissue, is reported. This characteristic pleomorphic pattern, which could lead to a wide variety of diagnoses, is illustrated. A possible association of the tumour with hypertension is

for his help at the operation and dissection of the tumour root.

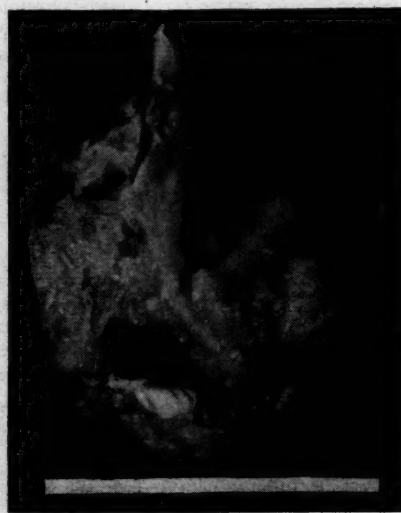


FIGURE II.

Tumour natural size; end of tumour reflected to show cut surface. White line is 2.5 inches long.

References.

- ALZNAUER, R. L. (1955), "Mixed Mesenchymal Sarcoma of Corpus Uteri", *Arch. Path.*, 60: 329.
- BOYD, W. (1955), "Pathology for the Surgeon", 7th Edition.
- GILMOUR, J. R. (1943), "A Recurrent Tumour of Mesenchyme in an Adult", *J. Path. & Bact.*, 55: 495.
- PACK, G. T., and LISA, J. R. (1954), "Mesenchymoma, Report of a Case", *Surgery*, 35: 277.
- SYMMERS, W. St. C., and NANGLE, E. J. (1951), "An Unusual Recurring Tumour Formed of Connective Tissues of Embryonic Type (so-called Mesenchymoma)", *J. Path. & Bact.*, 63: 417.

Legends to Illustrations.

FIGURE IIIA.—Showing clear angiomatous spaces walled by tumour tissue (x 250).

FIGURE IIIB.—Centre area of Figure IIIA, showing endotheliomatous cells lining vascular channels (x 1000).

FIGURE IV.—Showing area of fat and proliferating fibrous tissue (x 250).

FIGURE V.—Showing young fibrous tissue (x 1000).

FIGURE VI.—Showing myxomatous area (x 250).

FIGURE VII.—Shows fibro-lipomatous area with numerous new-formed capillaries. (x 250.)

PERINEAL TESTICLE.

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MAN and the chimpanzee are the only animals born with the testes in the scrotum where they remain permanently, and in man the testicles do not always reach the scrotum. The arrest of normal migration, cryptorchidism, is a common condition, whereas migration away from the normal course of descent is the rare condition of ectopia.

A cryptorchid is one in whom neither testicle is visible or palpable at several examinations; the term undescended testicle is used to describe a testis in the inguinal canal or just emerging therefrom—the condition may be unilateral or bilateral; retractile testicles are those that lie either low or high in the scrotum, but are at the least stimulus withdrawn by the cremaster into the superficial inguinal pouch or to the external inguinal ring and very occasionally into the abdomen.

Ectopia describes the testis, palpable and lying relatively fixed in the lateral inguinal, perineal, femoral or pubo-penile positions.

The essential anatomical difference between ectopia and cryptorchidism is the shortening of the spermatic cord in the latter condition, often together with some atrophy of the testicle, whilst in ectopia the cord is of ample length and the testicle of normal size; consequently the ease of repair in ectopic conditions is great, compared with the difficulty of guaranteed success in procedures for the cure of cryptorchidism.

The normal testicle has no range of movement in the scrotum, whilst the retractile testicle will move into the inguinal region or the abdomen, but can easily be manipulated back again into the normal position.

The undescended testicle lies in the inguinal canal, or is just emergent from it and cannot be brought further down.

The ectopic testis, normal in shape and most often in size, is attached, not always rigidly but with certainty, in an abnormal position to the surrounding tissues, and cannot be made to enter the scrotum.

Well over 90% of patients with undescended testes have an associated inguinal hernia; the *processus vaginalis* of the peritoneum directly communicates with the *tunica vaginalis*, and even extends beyond this as an empty sac into the upper part of the scrotum. (Koop states that the scrotum is opened by a pouch of peritoneum—the *tunica vaginalis*—which pushes into it via the inguinal canal,

and failure of this pouch to open the scrotum causes the concomitant defect of undescended testicle and inguinal hernia.)

Ectopia of the testicle has been classified under the following five headings. (i) Interstitial. The testis after leaving the external ring passes upwards and outwards towards the anterior superior iliac spine, and comes to rest upon the aponeurosis of the external oblique. This is the most common form of ectopia. (ii) Pubo-penile. The testis is found at the dorsum of the base of the penis overlying the pubic bone. (iii). Femoral or crural. The testicle occupies a position in Scarpa's triangle on the medial side of the thigh. (iv). Transverse. Both testes pass down the same inguinal canal and come to lie in the same scrotal sac. (v). Perineal. The testicle is found in the perineum, and is usually attached to the spine of the ischium; it lies between the base of the penis and the anus, and lateral to the raphe.

The testicles have their origin from the genital fold on the mesial side of the Wolffian body. They are originally placed in the lumbar region on either side of the vertebral column in front of the psoas muscles and internal to the kidneys. They descend along the posterior abdominal wall, bringing with them their vascular pedicle, and pushing before them the parietal peritoneum which is to constitute the vaginal processus, the beginning of the *tunica vaginalis*.

The gubernaculum appears at the end of the second month of intrauterine life as an actively growing cellular condensation, and plays an important role in the theories of testicular migration, normal or abnormal. At this stage it is premuscular, and is replaced by striped and unstriped muscle.

John Hunter first described this structure and named it the gubernaculum (meaning helm or rudder); his description, cited as the best, is as follows:

The testicle is connected in a particular manner with the parietes of the abdomen. This connection is by means of a substance which moves down from the lower end of the testis to the scrotum. At the present I shall call it the ligament or gubernaculum testis because it connects the testis with the scrotum and directs its course in its descent. It is of pyramidal form, its large bulbous head is upwards and fixed to the lower end of the testis and epididymis, and its lower and slender extremity is lost in the cellular membrane of the scrotum. The upper part of this ligament is within the abdomen before the psoas reaching from the testis to the groin or to where the spermatic vessels begin to pass through the muscles. Here the ligament runs down into the scrotum precisely in the same manner as the spermatic vessels pass down in adult bodies and is there lost. It is hard to say what the structure or composition of this ligament may be, it is certainly vascular and fibrous, and the fibres run in the direction of the ligament itself. It is covered with fibres of the cremaster or musculus testis which is placed immediately behind the peritoneum. This is not easily ascertained in the human subject but is very evident in other animals, more especially in those where testicles remain in the cavity of the abdomen after the animal is full grown.

Many theories have been advanced as to the normal and abnormal migration of the testicle, and John Hunter in describing the gubernaculum, like everyone since his time, puzzled over what was the motive force that put the testicle into the scrotum.

Pott, in 1775, thought that the testicles descended only after birth and were retained in the abdomen during fetal life to protect them from injury.

Curling, who wrote on the subject in 1841, was of the opinion that the only cause of descent of the testicle was the gubernaculum, showing by dissection that in cases in which the testicle had been retained in the groin, a dense cord of tissue could be traced from the gland to the lower part of the scrotum.

Lockwood, in 1887, was able to show several inferior insertions of portions of the gubernaculum, and on this basis originated the theory of the effect of multiple gubernacular tails. One of these tails passed to the normal terminus of the testicle in the scrotum, a second to the perineum, a third to the pubis, another to the root of the

penis, and a fifth to the external oblique aponeurosis near the anterior superior iliac spine, and a sixth to Scarpa's triangle. He assumed that the scrotal band was the best developed and therefore overcame the other processes and guided the testicle into its normal scrotal position. However, should one of the other processes be the largest and strongest, then abnormal pull would occur and ectopia result. Others have however failed to demonstrate any subdivisions of the gubernaculum, and even deny their existence at all.

McGregor, in 1929, showed that the fasciae of Colles and Scarpa produce, by arrangement of their fusion at the external ring, what he calls the third inguinal ring. This is surrounded by certain grooves and ridges which, if unduly prominent, may deflect the gubernaculum so that it does not lead the testicle through the third ring into the scrotum. According to the nature and course of the deflection, the testis will finish in one or other of the ectopic positions.

In perineal ectopia the testicle is always at a level between the root of the scrotum and the front of the anus, and laterally is always outside the line of the raphe. The overlying skin is freely mobile, and frequently the testis can be slipped about with the greatest of ease. The scrotum is asymmetrical, the empty pouch being rudimentary, but easily able to contain the testis when it is placed therein. There is seldom an associated inguinal hernia, but a small hydrocele is not uncommon. The key to ectopia appears to be the behaviour of the gubernaculum, but this structure varies in development from case to case. Cecil, reporting the 104th case in 1947, found a normal perineal testicle with a very dense structure at the lower pole, 0.5 centimetre in breadth, which extended into the perineum with a very solid anchorage. However, Wattenberg and others found only an ill-defined tissue which was easily freed by dissection.

The condition of perineal testicle still seems rare enough to report here another case, the 109th.

Clinical Record.

A., aged two years and six months, was examined in 1952 because the testicles had not descended into the scrotum. Examination then showed him to be a normally developed child, both testes appearing to be in the superficial inguinal pouch. More careful examination showed the right testicle to be retractile, and the left to be emergent—that is, at the external inguinal ring—but unable to be manipulated to a lower position. The mother was advised and asked to return with the child at intervals.

The child was not seen again until August, 1957, then aged seven years, when the right testicle was in the same position, but the left had descended to the perineum. The mother was concerned at the "lump" in the perineum. The child had had no discomfort or pain at any time during the descent of the testicle, nor had it caused trouble at play, such as riding a tricycle or sitting on a swing or seesaw. On this second occasion the right testicle was difficult to palpate, but by manipulation was capable of being brought from the superficial inguinal pouch to just below the inguinal canal. However, it could not be put into the scrotum. The left testicle was in the perineal region. It was a little larger than the right, easily palpable and mobile within limits, being tethered at its lower pole. The overlying skin was freely movable over the testis.

At operation the testis and epididymis were normal and the cord structures were readily identifiable and normal. The testis was firmly held in the ectopic position by a small band of tissue three millimetres wide and one millimetre thick, extending from the lower pole of the testis down to the region of the ischial spine. The *tunica vaginalis* was normally developed, but no hydrocele or hernia was evident. The testis was exposed by an incision made parallel to Poupart's ligament and continued down medially to the upper part of the scrotum. The structures of the cord and testis were readily identifiable, and with external pressure the testis was easily manipulated into the wound. There was no definite path down to the testis, but the connective tissue was easily opened to gain access to the organ, which was found tethered by a definite cord-

like band extending from the lower pole to the region of the ischial spine. This band having been divided, the testicle was readily freed from the surrounding connective tissue. A pouch was then formed in the left side of the scrotum with the finger (this was easily done), and a nylon suture was attached to the lower pole of the testis through the gubernacular pedicle; this was then led through the scrotal sac and threaded through the apex of the scrotum. As there was an adequate length of the cord, the testis was then easily placed in the scrotum. To prevent any retraction of the testis, the nylon thread was looped and attached with an intervening rubber band by strapping to the medial side of the thigh. This provided sufficient tension to retain the testis in the normal position at the bottom of the scrotum, but at the same time allowed movement to occur without jeopardy to the safety of the vascular supply of the testis and epididymis. This method of anchorage is also far easier to employ than the Thorek procedure, and far less uncomfortable to the patient. The wound was closed without drainage.

The child was allowed to move about freely in bed, and the rubber band and nylon suture were removed on the sixth day. Convalescence was normal, and the child was examined one month after operation, when he had a sound wound with the testicle normally placed in the scrotum. On the right side the testis is still in the superficial inguinal pouch, and the parents have been instructed regarding future management.

Summary.

The anatomy and topography of testicular abnormalities are discussed.

A description of the gubernaculum is given and theories as to its possible action are mentioned.

Perineal ectopia of the testicle is discussed.

A further case is reported, together with its management.

References.

- CAMPBELL, M. (1951), "Undescended Testicle and Hypospadias", *Am. J. Surg.*, 82: 8.
 CECIL, A. B. (1947), "Perineal Testicle", *J. Urol.*, 58: 384.
 CHARNY, C. W., CAUSTON, A. S., and MERANJE, D. R. (1952), "Development of Testis, Histologic Study from Birth to Maturity; Abnormal Variations", *Fertil. & Steril.*, 3: 461.
 EDINGTON, G. H. (1942), "Hernia, Inguino-scrotal and Interstitial, Associated with Undescended Testicle and Open Processus Vaginalis", *Glasgow M. J.*, 137: 72.
 KIMPE, J. H. (1952), "Surgical Treatment of Cryptorchidism", *J. Urol.*, 68: 352.
 KOOP, C. E. (1952), "Symposium on Pediatrics, Differential Diagnosis and Management of Undescended Testicle", *M. Clin. North America*, 36: 1779.
 RANKIN, L. M., and EGGER, S. A. (1942), "Advantages of Early Operation in Undescended Testis", *Am. J. Surg.*, 57: 182.
 WAKELY, J. C. N. (1953), "Perineal Testes", *Lancet*, 1: 1025.
 WATTENBERG, C. A., ROPE, M. G., and BRARE, J. B. (1949), "Perineal Testicle", *J. Urol.*, 62: 853.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"South African Snake Venoms and Antivenoms", by Poul Agerholm Christensen, M.B. (Copenhagen), Dip. Bact.: 1955. Johannesburg: The South African Institute for Medical Research. 161 x 71, pp. 136, with 43 illustrations. No price stated.

Based on personal observations and laboratory work as well as a review of the relevant literature.

"International Sanitary Regulations: Adopted by the Fourth World Health Assembly in 1951 and amended by the Eighth and Ninth World Health Assemblies in 1955 and 1956." Annotated edition: 1957. Geneva: World Health Organization. Price: 5s. (English), \$1.00, Sw. fr. 3.

Designed primarily to meet the practical requirements of port and airport health officers and others concerned with the application of the regulations.

The Medical Journal of Australia

SATURDAY, FEBRUARY 8, 1958.

SUPERANNUATION PROVISIONS FOR PRIVATE PRACTITIONERS: SOME FURTHER COMMENTS.

THE leading article on superannuation provisions for private practitioners which was published in the issue of January 4, 1958, has aroused a good deal of comment. Medical practitioners are naturally interested in any scheme which promises aid in making adequate provision for the future. Superannuation schemes of the type discussed have, of course, their critics. Even the experts differ on their merits, and no doubt any scheme will have defects; but a great deal of thought has gone into the Queensland scheme, and it was only after a most searching examination and prolonged discussion that it received the approval of the Commissioner of Taxation. It may be noted also that it has been sponsored by the Queensland Branch of the British Medical Association. Those who wish to know more about it are invited to address their inquiries to the Secretary, Medical and Associate Professions Superannuation Plan, B.M.A. House, 88 L'Estrange Terrace, Kelvin Grove, W.1, Brisbane, Queensland.

Another superannuation scheme which has attracted a good deal of attention is the Medical Practitioners Superannuation Fund, with its headquarters at 45 Hunter Street, Newcastle, N.S.W. Quite unintentionally but regrettably, in our preoccupation with the newly established Queensland plan, we omitted to refer to this Newcastle scheme in the previous article. The trustees, alert to the interests of their scheme, lost no time in springing to its defence. After a preliminary letter of protest, the following letter, dated January 17, 1958, was sent to the Journal over the signatures of three trustees and the manager of the fund:

Sir: Following on our short note to you, written after our attention had been called to the above article, in which we stated that there were a number of inaccurate statements, we now wish to deal with these statements in a more detailed manner as follows:

The outstanding feature of superannuation funds for self-employed persons is that the income of the fund shall be exempt from income tax if (a) the number of persons entitled to receive present or future benefits is not less than twenty (20) and (b) if the terms and conditions applicable to the fund at the time when the income was derived have been approved by the Commissioner of Taxation. This provision is contained in Section 23 (ja) of the Act and commenced to apply to income year ended June 30, 1952.

Line seventeen (17) of the first paragraph of the article under discussion reads: "UNTIL RECENTLY the private practitioner has had to depend for his retirement on his investment capacity during his working life, etc. etc." It is respectfully submitted that, as the provision has been in operation for over five (5) years, the availability of this facility is not new.

A group of Newcastle practitioners in 1953 explored the possibility of inaugurating a superannuation fund for medical practitioners, and after considerable research and advice from leading experts the Commissioner gave approval to the Deed of the Newcastle Doctors Superannuation Fund in 1954, and your journal was good enough to feature its establishment. Following numerous inquiries, membership was extended to contemplate all medical practitioners irrespective of their place of residence in Australia, and the name of the fund was duly altered to "The Medical Practitioners Superannuation Fund". All doctors known at that time were advised of the existence of this fund, and so great were the inquiries that your journal again assisted by inserting a paragraph that inquiries would be dealt with by us as speedily as possible. It is regretted therefore that in the second paragraph of the article you refer to the Queensland scheme as being the first of such schemes to receive the approval of the Commissioner of Taxation.

In view of the foregoing you will agree that it can fairly be claimed that the Medical Practitioners Superannuation Fund was the first of those designed to cover medical practitioners. In fact our advisers are of the opinion that our fund is the pioneer fund in Australia of all such funds. Now in its fourth year of existence, our fund has members in all States, and has become firmly established on an Australia-wide basis.

In introducing the amendment in 1952 the Treasurer stated that it was undesirable that the conditions for allowance of the exemption should be laid down in precise terms at the initial stage, since these might prove unduly restrictive in the light of experience of the funds which may ultimately be involved. It was officially stated that in the course of time it may be necessary to review the conditions in the light of practical experience. Exercising his discretion in this matter, the Commissioner of Taxation as late as November, 1957, has reviewed these conditions, and the deed of this fund is now being revised to conform therewith. Briefly, these are as follows: (a) That membership be restricted to doctors whose net income from personal exertion in the year exceeds one-half of the total income for that year and whose income from private practice exceeds one-half of the net amount of income derived from personal exertion in that year. (b) That the maximum scale of contributions be: £300 per annum up to the age of 45 years, £500 per annum between the ages of 45 and 55 years, £1000 per annum between the ages of 55 and 65 years. (c) The maximum amount of benefits is, including earnings on the members' contributions, but excluding capital accretions, £25,000 reduced by the sum of any benefits to which the member, his dependants, his nominees or his legal personal representative may be entitled to receive from other funds, the income of which is exempt under Section 23 (ja).

In our fund the trustees act in a purely honorary capacity, and no provision is contained in the trust deed for the remuneration of their services.

Finally, in the fourth last line of the article it is stated that "any other plan will probably be almost a replica of this one". It is considered that, as the Medical Practitioners Superannuation Fund was the pioneer of this movement and as printed copies of the trust deed have been circulated throughout Australia, it again may be fairly claimed that all funds formed subsequent to ours will be substantially a replica of the Medical Practitioners Superannuation Fund.

We welcome the apparent enthusiasm of another body to enter into this form of superannuation for the self-employed. The MEDICAL PRACTITIONERS SUPERANNUATION FUND at 45 Hunter Street, Newcastle, is anxious to help in this enthusiasm and is prepared to give advice from the experience which they have gained in fund management over the years.

Yours faithfully,

THE MEDICAL PRACTITIONERS SUPERANNUATION FUND.

We are glad to publish this letter in justice to the Medical Practitioners Superannuation Fund and to acknowledge their pioneering work. The point made by those responsible for the Queensland plan is that when they drew up a trust deed for a plan for self-employed doctors to take

advantage of section 23 (ja) of the Act, there was much discussion with the Taxation Department, because, as they were informed, no plan had received approval under that section, and theirs was in a sense a model. The essentials were agreed upon, and the trust deed received approval in September, 1957. For that reason the Queenslanders have maintained that theirs was the first trust deed under section 23 (ja) to be approved. Be that as it may, both schemes are now to conform with the recent requirements of the Commissioner of Taxation, and it is not our wish to promote or disparage either scheme on the grounds of priority. There is room for them both and possibly for others, the Federal Council at its last meeting having expressed the view that the establishment of such schemes was, so far as they were concerned, a matter for the individual State Branches of the British Medical Association. There seems no reason to expect any competition between such schemes to be other than friendly, though it is desirable that they should not be multiplied indefinitely.

One particular point to which attention should be drawn is the question of the amount contributed to a fund which will be allowable as a deduction from taxable income. The impression has been somehow gained that all such contributions (which may amount to as much as £1000) are allowable as deductions. This is not so. The position is as has been set out in the prospectus of the Queensland plan. Under section 82H of the *Income Tax and Social Services Contribution Assessment Act, 1936-1956*, any contributions paid to one of these plans will rank equally with life insurance premiums etc. as a deduction from assessable income. The maximum deduction allowed under section 82H is £300, and in any case where a member's total payments during any one year of income in respect of life insurance cover effected on the lives of himself, wife or children and contributions to the plan exceed £300, such excess amount will not be an allowable deduction from the member's assessable income. The income of the plan is, of course, not subject to income tax.

THE MODERN MEDICAL SCHOOL.

ELSEWHERE in this issue are some notes on "The Modern Medical School" compiled by Professor Samuel Hatfield, of the N.S.W. University of Technology. Professor Hatfield has had unusual opportunities to study this question, especially in the United States, and we welcome the facts that he sets out, as a contribution to the present discussion. At the same time, we consider that the patterns described are not necessarily applicable in Australia and would suggest that some of the ideas, supported though they may be by authorities overseas, should not be copied. The first of these is the entirely hospital-centred medical school. There are, of course, many things to be said for this type of school, and it has found favour in some places overseas. Nevertheless, there is one feature of the Australian scene that should be remembered in this regard. Most students coming to our universities are young and immature and often are already narrow and specialized in their academic outlook. The Murray Report states that what universities need above all in their students is "general education and intellectual training, curiosity and

a certain degree of maturity"; but for a number of reasons "the universities consider that the first year student is not mature enough to benefit properly from university work". The position is in general otherwise in many places overseas. In the United Kingdom and many European countries university entrants are approximately 12 to 18 months older than they are in Australia, and in the Sixth Form of English schools the practice is to introduce a measure of undirected study which develops self-reliance and critical judgement. In the United States the college system tends to bridge the gap. The college system is far from perfect, but there is much to be said for it, and it certainly should not be judged from the distorted impressions presented on films. The American college is a sort of junior university, which grants certain degrees such as bachelor of arts or science. It is essentially broad in its curriculum (sometimes absurdly so by our standards), but it does aim to give general education, and those who then go on to a university are in a better position to plunge into a specialized and more or less isolated course such as that at a hospital-centred medical school. If, when the position in Australia has been given sufficiently long and careful thought by those best qualified to advise on the matter, it is still considered that future medical schools would be best developed at all stages in direct relation to a teaching hospital, then further careful thought will need to be given to the preliminary general education of medical students. It is as well to remember also that not all universities are content to be merely examining and degree-conferring bodies.

The other controversial aspect of Professor Hatfield's paper to which brief reference must be made is that of the internal organization of teaching hospitals. The medico-political and other practical implications of setting up a full-time staff are great. General policy in regard to hospital administration and staff is in a state of flux at the moment in this country, and it is important that we should avoid the pitfalls into which some in other countries have fallen.

The classification of medical education into three distinct phases, undergraduate, graduate and post-graduate, as mentioned by Professor Hatfield, will bear much thought. If to this is added the preliminary education of the medical student, it becomes apparent that the planning of a new medical school is not to be undertaken lightly or hastily. Those responsible might also bear it in mind that much constructive and original thinking has gone into the planning of the new medical school of the University of Western Australia.

Current Comment.

INTRAVENOUS CARBON DIOXIDE IN RADIOGRAPHY.

AIR has long been recognized as a useful contrast medium in diagnostic radiology, but its use has been overshadowed by the menace of air embolism. One of the earlier procedures of this type was direct perirenal insufflation, but the danger of this manoeuvre is now generally recognized, and it has been largely replaced by

retroperitoneal pneumography using the presacral route. However, in 1956, C. L. Ransom, R. R. Landes and R. McLelland,¹ conducting a nation-wide survey in the United States, were able to gather 58 cases of death, and 64 near-fatal reactions, following retroperitoneal pneumography, in an estimated total of 12,000 such investigations. They were able to confirm that the presacral route was safer, since only 24 deaths followed this method, as against 34 deaths following the use of the lumbar route, though the former was by now much more commonly used. However, they were still appalled by these figures, and were prepared to abandon retroperitoneal pneumography altogether, when their attention was directed to the work of T. M. Durant and his colleagues, who had been experimenting with intravenous injection of carbon dioxide in dogs. Both groups have recently published further contributions to the subject. Durant *et alii*,² after reviewing the dangers of air as a contrast medium, point out that the answer lies in the use of a gas which is sufficiently soluble to avoid the risk involved in using air or oxygen. Carbon dioxide is 20 times as soluble in serum as either of these gases. They note in passing that gynecologists have long been using carbon dioxide for the Rubin test, without any reported fatalities. They go on to refer to experiments in which very large amounts of carbon dioxide (7.5 millilitres per kilogram) were injected into the systemic veins of dogs without ill effects. This produced no more than a transitory rise in the carbon dioxide content of the blood, with a brief associated hyperpnea. The maximal change in blood gas concentration was reached in 15 to 30 seconds, and return to normal was complete in one to two minutes. Having thus established the complete safety of their method, they next proceeded to use it for the visualization of the cardio-vascular structures. By the use of special radiological techniques, the inferior vena cava, right atrium and right ventricle were readily visualized after carbon dioxide had been injected into a femoral vein. They were even able to record the movements of the pulmonary valve. They also injected gas directly into the left ventricle, which enabled them to visualize the cavity of the left ventricle and the movements of the aortic valve.

The next step was to expand this technique to the investigation of human subjects, and they have now used the method successfully on a score of different occasions, for the investigation of patients with mitral stenosis and with pericardial disease. In discussing their technique, the authors stress the importance of using pure carbon dioxide, and explain their precautions to exclude any air from their system. Fifty to 100 millilitres of gas are injected rapidly into any convenient systemic vein. They have so far avoided using more than two millilitres per kilogram of body weight, but consider this is perhaps unnecessarily cautious, as they have used far greater relative amounts in dogs without ill effect.

Their paper thus has a double significance. First, by demonstrating the safety of the intravascular injection of carbon dioxide gas in substantial quantities, they show conclusively that the use of pure carbon dioxide, when a gaseous contrast medium is required in the tissues, is a complete safeguard against the danger of serious embolism. Secondly, they put forward a new technique for the visualization of intracardiac structures, and for the investigation of pericardial disease.

Almost simultaneously with this contribution from Durant *et alii*, Landes and Ransom³ have published an account of a technique for the use of carbon dioxide in presacral retroperitoneal pneumography. After emphasizing again the dangers of using air, they point out that many urologists are under the illusion that oxygen is safer than air; others are under the same misapprehension as regards helium. In fact both gases are just as dangerous as air. The use of carbon dioxide requires a special technique, which they describe, owing to its rapid absorption. However, there seems little doubt that once these facts are generally recognized, the use of air in retroperitoneal pneumography will no longer be acceptable.

Thus a problem which has faced the profession for a considerable number of years appears to have found a happy solution, but it is chastening to reflect that in 1940 R. M. Moore and C. W. Braselton,¹ injecting carbon dioxide in the pulmonary vein of a dog, observed the gas passing through the heart, entering the coronary vessels, and disappearing into solution before their eyes, without any apparent ill-effects on the myocardium.

SIR WALTER MORLEY FLETCHER.

In the early part of the present century, Walter Morley Fletcher earned fame and scientific distinction for his experimental work in physiology during a long association with the University of Cambridge as Fellow and Senior Tutor of Trinity College, and afterwards for his outstanding achievements as the enthusiastic and devoted secretary of the British Medical Research Council, which he served faithfully from 1914 until his death in 1933. By virtue of sheer intellectual capacity, moral integrity, organizing ability, sound common sense and ripe experience in laboratory routine, together with that rare gift of making and retaining lasting friendships among worthy people from all classes of society, he expended most of his genius and unbounded energies with conspicuous success in directing, encouraging and promoting original research in the medical and allied sciences.

Ever mindful of the "bright countenance of truth", as John Milton and her adored husband saw it, Lady Fletcher² has written a charming, highly intelligent and delightfully uninhibited account of Fletcher's meteoric career, of their own happy partnership in domestic responsibilities and public usefulness, of interesting events and personalities within their joint family circles, and of entertaining sidelights on the many distinguished friends, scientists, doctors and statesmen with whom their position in the social and academic world brought them into close, pleasant and fruitful contact. The narrative is given an impersonal and objective quality by consistent references to Maisie as a third person telling the story; but there is something entirely wholesome and ingenuous in the open way in which facts are related about the background of their respective families, the inmost thoughts and aspirations of a devoted couple, their periods of emotional depression and uplift, and the help afforded at all times and in all situations by a deep-rooted belief and trust in the higher aesthetic and spiritual values which continually dominated their minds and actions.

As a valuable supplement to Lady Fletcher's personal biography, Sir Arthur MacNalty has contributed five short chapters at the end of the book, giving an authoritative exposition in technical terms of Fletcher's work with Sir F. Gowland Hopkins in the Cambridge laboratories, which culminated in their joint Croonian Lecture before the Royal Society of London in 1915. This is followed by separate accounts of the Medical Research Committee in the early days of its formation, the discovery of its true value as a coordinating body in the first World War, and, finally, its establishment as an essential organization, independent of political influence, under the direct supervision of a special committee of the Privy Council, covering the period during which Sir Walter Fletcher served as its indefatigable organizer and guiding spirit.

This book about Walter and Maisie is an essentially human document which must surely provide inspiration and encouragement to any reader with lofty sentiments about good living and public duty. It gives an intimate picture of English life and manners, in those halcyon days before the time-honoured social levels became severely thrown out of alignment by the rising pressures of the political and economic adjustments demanded by the Welfare State.

¹ *Ann. Surg.*, 1940, 112: 212.

² "The Bright Countenance: A Personal Biography of Walter Morley Fletcher", by Maisie Fletcher; 1957. London: Hodder and Stoughton. 8½" x 5½", pp. 352, with several illustrations. Price: 25s. (English).

³ *J. Urol.*, 1956, 76: 664.

² *Ann. Int. Med.*, 1957, 47: 191 (August).

³ *Surg., Gynec. & Obst.*, 1957, 105: 268 (September).

Abstracts from Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Anti-Fungal Activity of Triacetin.

S. G. KNIGHT (*Antibiotics & Chemother.*, April, 1957) tested the in-vitro activity of triacetin (glycerol triacetate) against a range of common skin fungi and against *Candida albicans*, by measuring the diameter of the colony grown on Sabouraud's agar containing a known amount of the drug. In general, inhibition of growth was noticed in the presence of 9.1% of the drug; 10% human serum added to the medium considerably enhanced the inhibition, although *C. albicans* was an exception to this. No induced resistance could be developed in the sensitive strains. The authors discuss the suggestion that the activity is shown only against organisms or fungi possessing an esterase which liberates acetic acid as it breaks the bond with glycerol, and the lowering of pH apparently potentiates the inhibiting effect.

Electron Microscope Study of Newcastle Disease in Tissue Culture.

G. HOTZ AND F. B. BANG (*J. Path. & Bact.*, April, 1957) have followed their culture experiments with an electron microscope study of chicken macrophages infected with the virus of Newcastle disease. While no new information was obtained on the morphological course of virus reproduction, changes were seen in the structure of the macrophage itself. The cells grown in roller tubes appeared to have numerous extensions of the surface which surround fluid droplets. The large dose of virus used, 10,000 infectious units of virulent virus, was not found on the cell surface, but was seen in the ingested fluid droplets in the cell. Destruction of the cell substance occurred at five hours. No specific lesions were observed.

Bacteriemia and Staphylococci.

D. ROGERS AND M. A. MELLY (*J. Exper. Med.*, February, 1957) have continued their studies on bacteriemia by making further observations on the granulocytopenia induced by the intravenous injection of staphylococci. They used anesthetized rabbits with cardiac catheters inserted under fluoroscopic control, and introduced inocula of a coagulase-positive staphylococcus into the left marginal ear vein. Arterial samples were obtained from the left femoral artery. The first effect seen was a transient marked fall of circulating leucocytes, followed by a return to normal. The lost leucocytes were trapped in the pulmonary vascular bed, and the increased numbers subsequently found suggested that they re-entered the blood-stream. Removal of the spleen or the administration of cortisone did not alter this. All the staphylococci in the blood-stream were within polymorphonuclear leucocytes

within 10 to 40 minutes of injection. The authors believe that these organisms within the leucocytes play a part in maintaining the bacteriemia.

The same authors continued the work (*ibidem*) by examining the blood-stream clearance of *Escherichia coli* in rabbits. A similar clearance after injection of these organisms was brought about by leucocytes trapped in the liver and spleen, but it operated over a much longer period — up to 90 minutes. *Escherichia coli* is rapidly killed after ingestion by leucocytes. However, an increasing bacteriemia then developed, indicating that some bacteria were viable and could re-seed the circulating blood. Further studies of the mechanisms concerned will be described later.

Capacity of Polysaccharides to Elicit Antibodies.

P. Z. ALLEN AND E. A. KABAT (*J. Exper. Med.*, May, 1957) reported results of studies on the capacity of some polysaccharides to elicit antibody formation in man. They used the production of erythema or weal type sensitivity and the appearance of precipitins in the serum as evidence of antigenicity. Their levans were produced from various bacteria including *Leuconostoc* and *Aerobacter*, as well as maize glycogen, apple pectin and amylopectin, usually prepared in saline containing 0.25% phenol, at a concentration of one milligramme per millilitre. The purified levans gave clear-cut results indicating the antigenicity of the material used. Apple pectin, maize glycogen and polyglucose did not. During the work laminarin, a neutral polysaccharide obtained from *Laminaria digitata*, was found to give precipitates with normal human serum.

Chlortetracycline and the Faecal Flora.

B. RUEBNER (*J. Path. & Bact.*, April, 1957) has studied the effect of chlortetracycline on the faecal flora of patients with and without cirrhosis of the liver as a means of attempting to study the influence of production of toxic metabolites from the intestine in liver disease. Fifteen patients were studied, and six patients without detectable liver disease were included as controls. Results showed only a slight reduction of the total bacterial count, due mainly to a suppression of *Bacteroides* strains. However, there was a change in distribution, as sensitive coliform bacilli and streptococci were replaced by resistant forms, and there was a large increase in *Proteus*, while three patients developed considerable numbers of resistant *Staphylococcus pyogenes*. This last finding appeared to be the most significant in the study.

Vectors of Murray Valley Encephalitis.

D. M. McLEAN (*J. Infect. Dis.*, May-June, 1957) studied vectors of Murray Valley encephalitis (M.V.E.). Preliminary work showed that the prevalent culicine species in the Murray Valley, *C. annulirostris*, could become carriers of the virus after having been allowed to feed on deliberately infected rabbit blood. The virus persisted as long as 41 days, and

could be transmitted to chickens on which the mosquitoes had been allowed to feed. Seven other culicine species could also transmit the virus. Two anopheline species in the United States did not transmit the virus. *Culex annulirostris* feeds readily on domestic fowls and presumably also on wildfowl, chiefly water birds, since 40 out of 90 examined had antibody to M.V.E. in their serum; but only 11 of 60 land birds tested showed evidence of M.V.E. antibody. Final proof is needed of the isolation of virus from mosquitoes captured during or before an epidemic.

HYGIENE.

Staphylococcal Infections in New-Born Infants.

T. E. SCHAFER, R. V. SYLVESTER, J. N. BALDWIN AND M. S. RHEINS (*Am. J. Pub. Health*, August, 1957) report the results of investigations into a number of epidemics of staphylococcal infection in hospital nurseries. The aetiological agent in the majority of these epidemics is a penicillin-resistant *Staphylococcus pyogenes*, phage type 42B/47C/44A/52/80/81. It has been found responsible for at least 40 epidemics in all parts of the world. Bacteriophage typing and determination of antibiotic sensitivity are shown to be valuable techniques for the epidemiological study of staphylococcal infections. Control of outbreaks in nurseries depends on prevention of nasal colonization in infants. Prophylactic medication with an appropriate antibiotic offers a practical method for preventing nasal colonization. Nasal carriage precedes clinical infection in these epidemics. The majority of infants who develop infection do so after discharge from the hospital. The authors consider that the most important step in the control of these epidemics is to make staphylococcal disease in infants aged under two months and mastitis in nursing mothers notifiable diseases. This action would enable public health authorities to investigate hospital nurseries as possible sources of infection.

Mortality, Morbidity and Retirement.

J. S. TYHURST, L. SALK AND M. KENNEDY (*Am. J. Pub. Health*, November, 1957) studied the effect of retirement on mortality and morbidity rates in groups of pensioners who had retired from daily occupations. To do this they investigated the life expectancy and mortality and morbidity rates for retired employees of an organization with approximately 9000 employees. The relation of physical health to retirement was determined by the study of the company's medical records of each pensioner; in addition, each pensioner was visited periodically and his general health and any disabilities were noted. The combined results of these studies led to the conclusion that in the industrial population studied retirement did not hasten death, nor did it lead to deterioration of health. On the contrary, there was some evidence to suggest that the mortality rate was lower in the period immediately following retirement than it was later on, regardless of the age at retirement. There was also

some indication that people retiring at a younger age had lower mortality rates in their later years than did people who retired at an older age. With regard to health, there was an improvement in health status after retirement rather than a decline for the majority of the people studied.

Dust Particles in City Atmospheres.

M. B. JACOBS, M. M. BRAVERMAN, C. THEOPHIL AND S. HOCHHEISER (*Am. J. Pub. Health*, November, 1957), in a short article, discuss various methods of counting and measuring dust particles in outdoor city atmospheres. A simple and direct method that has been successfully used for a year in the Laboratory of the Department of Air Pollution Control, City of New York, is then described. In seven minutes 2.47 cubic feet of air are drawn through a one-inch "Millipore" filter paper held in an aerosol microanalysis holder. The filter paper is then put on a slide, cedar oil is added, and a cover slip is placed on top. Dust particles on the filter paper are then counted and their size estimated by means of an "MSA" microprojector. By the use of this method it was found that the average monthly dust count for various locations in New York City varied from approximately three to 12 million particles per cubic foot of air. Approximately 85% of the particles were less than one micron in diameter.

High School Health Service Problems.

M. M. OSBORNE (*Am. J. Pub. Health*, October, 1957) draws attention to the number of people concerned with the welfare of the adolescent child in a country with a highly developed social system and the confusion that may result in the mind of the child concerned if the efforts of those people are not coordinated. The parents, the school principal, teachers of individual subjects, the school doctor, nurse and guidance officer, the family doctor, doctors of various medical clinics and various other people may be all legitimately concerned in the welfare of a senior school child. To avoid confusion the author suggests a problem-solving or guidance committee, consisting of those primarily interested in child welfare and with the power to consult specialists, to consider the problems of any particular child. After deciding on necessary actions this committee would then appoint a person within the school most suitable to be the child's adviser to assist the child along the lines decided on by the committee.

Blood Cholinesterase Activity.

J. H. WOLFSIE (*Arch. Indust. Health*, November, 1957) outlines the place of routine periodic estimations of blood cholinesterase levels in the prevention of poisoning by organic phosphorus compounds, such as parathion and malathion, in a factory where these are prepared. More than 5000 estimations have been made. The method of estimation is given, and if it is followed accurately the author considers reliable results will be obtained. As normal cholinesterase levels vary, it is necessary to know an individual's normal preexposure levels to

determine whether a low estimation indicates a normal low level or is due to mild exposure. For the same reason, a series of estimations made at intervals which indicates rising or falling levels is of more value than a single estimation. As red blood cells and blood plasma respond differently to exposure in degree and time, simultaneous estimations of cholinesterase levels in red blood cells and in plasma help to determine the degree of exposure. The author states that after some experience one can deduce the approximate time and magnitude of exposure and whether it was single or multiple. Reports on a number of cases together with red cell and plasma cholinesterase level curves are given to illustrate these points. Signs and symptoms of poisoning occur when the cholinesterase level in affected organs and nervous tissues falls to approximately 25% of normal. There is then only a narrow margin between this point and the levels at which death occurs. The author stresses the need for periodic cholinesterase level estimations as a check on the effectiveness of other routine preventive measures.

Gas Mask Protection Against Diborane and Pentaborane.

J. E. LONG, G. J. LEVINSKAS, W. H. HILL and J. L. SVIRELY (*Arch. Indust. Health*, November, 1957) investigated by chemical tests and animal exposure studies the value of five substances as gas-mask filters for temporary protection against exposure to the boranes. Details of the methods used are given. Protection against diborane was obtained by the use of a chemical cartridge charged with active "Hopcalite". The animal exposure studies showed that temporary protection against pentaborane may be obtained by the use of a chemical cartridge respirator charged with activated carbon. A filling medium of silica gel and activated carbon provided temporary protection to animals exposed to a lethal mixture of pentaborane and decaborane. A composite filling medium of silica gel, active "Hopcalite" and activated carbon provided temporary protection to animals exposed to a lethal mixture of diborane, pentaborane and decaborane.

SURGERY.

Surgical Treatment of Coronary Artery Disease.

H. E. MOZEN (*Surgery*, August, 1957) begins by stating that present-day medical therapy has not solved the problem of coronary artery disease, with its high yearly mortality and morbidity. Since a high percentage of this mortality is due to electrical instability of the heart, effort should be directed toward providing an even distribution of available blood throughout the myocardium, and this is best done by stimulating the production of intercoronary anastomoses. These new channels can provide blood to ischemic myocardium when it is needed most, which is at the crisis of coronary occlusion. The author claims that adequate coronary anastomoses and an even distribution of blood can protect against a fatal heart

attack and reduce the amount of myocardial destruction following occlusion, and can relieve the pain of *angina pectoris*. He considers that the Beck I operation, which stimulates the production of intercoronary channels and an even distribution of coronary blood flow, should be performed on patients with clinically significant disease. The author describes the Beck I operation in detail, pointing out that it has four components contributing to the formation of extracoronary and intercoronary anastomoses, namely (i) pericardial-epicardial abrasion by special burr; (ii) partial ligation of the coronary sinus; (iii) application of an inflammatory agent, such as powdered asbestos; and (iv) grafting of mediastinal fat. In a group of 71 patients with coronary disease who were treated by surgical operation, the mortality was 1.4%. Early post-operative relief of symptoms occurred in 58% of this group. The author has followed each patient up for from six months to two years, and during this period 10 patients (14.3%) died owing to progression of their disease. However, of the survivors, nine out of 10 are relieved of anginal pain completely or almost completely, and are back to work with little or no restriction.

Large Bowel Injuries.

R. G. PONTIUS, O. CRECH AND M. E. DE BAKEY (*Ann. Surg.*, August, 1957) point out that while the use of exteriorization and proximal colostomy may be necessary in the management of war wounds of the large bowel, from their experience the majority of injuries encountered in civilian practice may be treated by primary repair. They analyse 122 consecutive cases of colonic injury at the Jefferson Davis Hospital. Of 119 survivors, 83 were treated by primary repair and 36 by a two-staged procedure, the mortality of the entire series being 15.6%. The average hospital stay in the group treated by primary repair was 13 days, as compared with 37 days in the group treated by a two-stage procedure.

Fatal Post-operative Pancreatitis.

D. O. FERRIS *et alii* (*Ann. Surg.*, August, 1957) report nine cases of fatal post-operative pancreatitis occurring at the Mayo Clinic from 1940 to 1955 inclusive. They comment that acute pancreatitis is an alarming and often fatal post-operative complication, usually following surgical operations on or about the pancreas, though it can occur after operations far removed from that organ, especially on the prostate. The cause is unknown.

Vesico-Intestinal Fistula.

H. C. E. M. HOUTAPPEL AND A. M. GRÜNDEMANN (*Arch. chir. neerl.*, Volume IX, fasciculus II, 1957) give a description of three cases of vesico-intestinal fistula caused by regional enteritis. In two cases the bladder symptoms were predominant over the intestinal symptoms after the fistula had developed, so masking the cause of the fistula. Pneumaturia was a late symptom in all cases and was never spontaneously reported by the patient. Resection of the affected bowel is recommended.

Medical Education.

THE MODERN MEDICAL SCHOOL.

RECENTLY in the New South Wales daily Press there has been much discussion and controversy concerning a proposed new medical school. Even though the news has created considerable interest, at times it has been rather confusing in its implications.

The thought has occurred to me that perhaps some of the readers of *THE MEDICAL JOURNAL OF AUSTRALIA* may be interested in the present-day concepts of the medical school as taught to the students of the School of Hospital Administration of the New South Wales University of Technology. Herewith is an abstract on the modern medical college from the notes given to the students in the course subject "Medical Administration", which deals with medical education, administrative deanship and medical staff organization in the hospital.

I present this article in order that those of your readers who are interested in medical schools and teaching hospital management and organization can equate their own views with those of the present-day world experts on this important aspect of medical administration.

At the same time it affords me an opportunity to convey to the readers some of the work that is carried out at the School of Hospital Administration. There are many people who have the wrong concept of a School of Hospital Administration. In their minds it implies that the instruction and training deal with accounting and secretarial practice. I would like it to be made known that this is only one small part of the work, and that there is a tendency overseas now to alter the title to "School of Hospital and Medical Administration".

The Modern Medical College.

The general concept of a medical school is a building situated at a university where basic medical sciences are taught to medical undergraduate students. This concept is out of line with contemporary thinking.

The modern medical school is centred at a hospital and consists of two closely coordinated and component parts: (i) basic medical sciences; (ii) clinical sciences, which unit is generally referred to as the teaching hospital. It is essential to have both these component parts physically located together and integrated as one administrative unit. This unit is referred to as a "University Medical College". It may also include a school of dentistry.

The use of the term "pre-clinical" is deprecated at the School of Hospital Administration. It places emphasis on the clinical sciences. It may be argued that the basic medical sciences must not be confused with the basic sciences, which are "pre-medical" and taught in the faculty of science.

In other words, emphatically and categorically the unit of clinical sciences or teaching hospital should be an inherent part of a university for the purposes of control and administration.

To say that there should be a medical school for so many millions of population shows a lack of understanding of the concept of the modern medical college.

The number of medical schools in a community is dependent upon the number of teaching hospitals available. The hospital is the key to the problem. If there are established six teaching hospitals in a community, there should be six medical college "units". They may all be responsible to the same university or different universities. The ideal situation is to have the medical college established adjacent or in close proximity to its university, but this is not fundamental to the problem.

The Medical Centre.

The functions of a hospital are (a) patient care, (b) education and (c) research.

The district hospital is primarily concerned with patient care. In a teaching hospital the standard of patient care should be of such first-class quality that it may be in some measures considered a minor role, and in effect the hospital's major function is one of education and research. Education is concerned not only with medical students and doctors, but also with nurses, physiotherapists, X-ray technicians etc., and a host of other professional and non-professional personnel. Hence "schools" for all these subsidiary groups must be included. Research is concerned

not only with medicine and surgery, but also with sociology and all the other allied fields associated with hospital service.

Therefore, it is essential to establish obstetrical, psychiatric, geriatric, rehabilitation, dental and cancer therapy units as part of the hospital and not geographically independent. Not only is this necessary for education and research, but it affords "complete" or "total" patient care at the one place and the modern development of "team" work of the whole professional staff.

Consequently, our medical college can now be referred to as a medical centre.

For the very same reasons of education and research, it is essential that the basic medical science school, with its departments of anatomy, physiology, pharmacology and biochemistry etc., be integrated with the hospital and not divorced from it geographically and administratively.

Number of Students.

The admission quota of students from the second year is dependent upon the beds available. It is generally considered there should be ten beds per student. However, it is possible to operate efficiently with five beds per student (Hatfield: Thesis "Administrative Problems of Medical Schools", Johns Hopkins, 1954), i.e., approximately 40 students per each year per 600 beds. A medical college will require a minimum of 600 beds for the development of its medical centre with the inclusion of all clinics necessary. Medical centres generally have a load complement of approximately 1000 beds with 65 to 70 medical undergraduates per year.

The Criteria for a Modern Medical School.

World authorities consider that there are six essential criteria for a modern medical college. These are:

1. A full-time faculty medical staff, with each member holding academic rank and status accordingly, i.e., professor, associate professor, reader etc. The basic sciences are considered of equal importance with the clinical. Consequently, a professor of physiology or pathology has equal status with a professor of medicine or surgery.

2. Complete departmentalization of the medical staff into the various specialties, such as gynaecology, urology, orthopaedics etc. with a "chief of service head" for each department, and a line of seniority for every doctor on the faculty medical staff. Until recent years, medical colleges operated with a nucleus of full-time staff and with a full-time professor as the "department head", or "chief" of the particular service. The visiting staff were given academic rank accordingly, and gave their services free to public out-patient clinics. For this service they were entitled to use private and intermediate beds. If they gave definite periods of time for lecturing or tutoring to medical undergraduates or graduate doctors undergoing specialist training, they were paid for this particular service on a sessional basis. The expenditure incurred was a charge on education and paid for by the University. With the advancement of medical science, and consequently the development of more and more specialties, the problem of education has become a greater one. This, also, at the same time, has placed emphasis on more and more research. Consequently, these two factors of education and research have meant a progressive increase of full-time staff. Today, the trend is towards either full-time staff or "geographic" full-time staff, with the doctor working in close proximity to his "hospital workshop".

3. Three classifications of medical education—namely, undergraduate, graduate and post-graduate. Each of these classifications is distinctly different and must not be confused with the others. Medical science has made tremendous and profound advancement in the last fifty years, and where once an undergraduate education would have sufficed, there has been a shift of formal education to the graduate or second stage. In effect, and in some measures the second or graduate stage is assuming the paramount role. The disciplines of social medicine, sociology, biostatistics and preventive medicine have now assumed major proportions in the undergraduate curriculum. In other words, an M.B., B.S. degree should mean nothing more than a "certificate of entry" to the teaching hospital or one of its ancillary hospitals for a definite period of graduate education. It takes five to seven years of formal graduate training to produce a specialist. There are approximately twenty-five specialties. The road to specialdom is a long and arduous one, and the medical graduate is approximately thirty years of age on the completion of his specialist training. A young doctor needs three years of training in a unit of clinical science to become a good general practitioner. In his third year, he should be apprenticed to a competent general prac-

tioner for a definite period of time. In effect, the young graduate doctor is primarily attached to the unit of clinical sciences for the purposes of his training, not for dispensing patient care. For the purposes of the advancement of graduate education, for the training of both specialists and general practitioners, it is essential to have a number of ancillary accredited hospitals linked to the main teaching hospital. Post-graduate education is the third period when the doctor returns to his medical college to further his knowledge and training; also to discuss and share with his colleagues their experiences and viewpoints. He may also travel overseas to learn new techniques and methods.

4. A ratio of 40% to 45% of intermediate and private beds to public beds. Every patient in the hospital is utilized for teaching purposes. The classification of beds into these three categories affords nothing more than "hotel standard of accommodation", and there should be no discrimination shown in the quality of patient care.

5. Private and public out-patient clinics. The medical college should be responsible for billing for professional fees the patients attending the private out-patient clinics. This large source of income, which is pooled, affords additional revenue to pay salaries comparable with incomes earned in private practice. This revenue must not be confused with the usual hospital bed charges. Salaries should be graded according to academic status. Consequently, the medical staff can give their undivided time to patient care, education and research free from economic worries. Every faculty member of the medical staff has his time strictly allotted into one or more of these three categories.

Administrative Control.

The control of the medical college should be in the hands of a warden with senior status, who is answerable to the council or senate of his university. He should be a competent administrator, possessing a sound knowledge of hospital and medical affairs. Under him there should be a full-time administrative dean in charge of medical education in all its phases, and a hospital administrator in charge of the management of the unit of clinical sciences and medical centre. There should be a medical director for the organization of the faculty medical staff.

This allows for maximum coordination, integration and efficiency.

Cost of Operation and Maintenance.

It is stated that maintenance costs of the teaching hospital are 25% over and above those of a general hospital. This shows a lack of understanding of the nature of costs incurred. The cost of maintenance should be considered in the three categories of patient care, education and research.

The cost of patient care for a teaching hospital is the same as a comparable general hospital, provided they are operating the same services and the same number of beds. One hospital may have a deep therapy or geriatric unit which the other may not. Consequently, this will reflect on the variation of the cost of patient care.

However, sound accounting practices are not used, and consequently expenditures incurred for education and research are not differentiated from those for patient care.

The mounting costs of education and research are assuming greater proportions in relationship to patient care. For the accountant, the education of paraprofessional personnel and the ancillary groups such as technicians, by the establishment of many subsidiary schools, now creates a major task in costing. However, it is essential to dissect these costs if a true state of affairs is to be assessed for budgeting and maintenance of the modern medical college.

Medical Administration.

The school of hospital administration, which is established in the medical college, is concerned not only with the education and training of potential hospital administrators, but also with the specific field of "medical administration". Medical administration is concerned with the training of selected doctors to become administrative deans of medical schools or full-time medical directors for the organization of medical staff in major hospitals.

In effect, the modern medical college can be looked upon as a large centre of education and research dealing with all facets of hospital affairs. It is a hub of medical and hospital activities. In terms of human welfare the quality of administration and patient care within the district hospitals of our community is a reflection upon the medical centre, because from our medical centre our trained doctors, nurses, medical technicians and hospital administrators pass

out to take their place within the community. If the quality of patient care and management in the medical college is not of high standard, then we can expect little from district hospitals.

The modern medical college today is a complex, gigantic management and financial undertaking.

SAMUEL HATFIELD,

Professor of Hospital Administration,
N.S.W. University of Technology.

British Medical Association.

NEW SOUTH WALES BRANCH: SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on September 26, 1957, at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, Dr. G. L. Hows, the President, in the chair.

Anæsthesia in Cardio-Vascular Disease.

DR. S. V. MARSHALL read a paper entitled "Anæsthesia in Heart Disease" (see page 174).

DR. R. D. PUFLETT read a paper entitled "Pre-existing Cardiac Disease in Anæsthesia" (see page 176).

DR. F. H. HALES WILSON said that trouble rarely occurred when a patient was known to have heart disease. Trouble occurred in operations on patients whose heart disease was unsuspected, especially if it was coronary disease. If possible no patient should be subjected to operation in a state of congestive cardiac failure. Referring to the recognition of congestive cardiac failure, Dr. Hales Wilson said that it was usually left ventricular failure first, and as such was often overlooked. As Dr. Marshall had said, in elderly patients it was often mistaken for bronchitis; however, usually the history was there if it was sought, and often there was a story of increasing breathlessness over the past weeks or months or of paroxysmal dyspnoea, even if only mild. In such cases, if it was possible to delay the operation, it was important to postpone it and control the patient's condition by digitalization and the removal of excess sodium by diuretics. Dr. Hales Wilson said that he agreed with the speakers that even in the presence of a damaged heart, provided that the patient was not actually in a state of cardiac failure, with modern anæsthesia and modern surgery there was very little danger in operating.

DR. N. W. BARTROP said that it was a common occurrence to see patients brought for operation who were receiving doses of some hypotensive agent. If a major procedure was to be performed, in his opinion it was not very desirable. Dr. Bartrop asked both speakers how long before operation administration of hypotensive agents should be discontinued, and also for what period after operation they should be withheld.

DR. ERIC DAVIS asked Dr. Marshall to comment on the use of "Prostigmin". Dr. Davis said that he presumed that it was an anti-curare agent. As "Prostigmin" was a very long-acting cholinesterase, Dr. Davis asked Dr. Marshall whether he had had any experience with shorter-acting cholinesterases.

DR. F. A. E. LAWES said that he agreed with Dr. Puflett that the two most important contraindications to operations on cardiac subjects were lack of oxygen shown by breathlessness, and hypotension. It was not always possible to judge the patient's heart condition from the electrocardiogram, which was often normal. If a patient was not subject to breathlessness, and if his exercise tolerance was good, operation should be permitted. In a sudden emergency a lot of faith could be pinned on a carefully given "open ether" anæsthetic, but plenty of oxygen was required. Dr. Marshall had said that if the patient was being anæsthetized with nitrous oxide and oxygen, it was permissible to use less and less oxygen with more nitrous oxide. Dr. Lawes said that a patient with heart disease should not be allowed to go blue under the anæsthetic; that had happened frequently in the old days and had caused much anxiety.

DR. C. A. SARA said that the subject for the meeting had been suggested by the anæsthetists, because the physician who lectured to them had said that a patient who had had a coronary occlusion should never have an anæsthetic. The purpose of the meeting was to qualify that statement. Dr.

Sara said that he was not aware that chlorpromazine was much in use by anaesthetists. Referring to nitrous oxide, Dr. Sara said that used in the modern way it produced no anoxia. Except perhaps in dental anaesthesia, there was no cyanosis directly attributable to nitrous oxide. The teaching in the Faculty of Dentistry was that nitrous oxide induction was given only to children, and only rarely to adults.

Dr. DOUGLAS JOSEPH said that anaesthetists were expert in anaesthesia, but often not very expert physicians. He referred to what he described as the rather contentious matter of the physician's being asked to see a patient and being able to tell whether he was fit for anaesthetic or operation. Dr. Joseph said that he had always thought that the physician was in no secure position to say so. A physician with much experience with patients suffering from heart disease could give an opinion as to the patient's cardiovascular system, and except perhaps when such a procedure as a direct attack on the heart, such as cardiotomy, was contemplated, it was the physician's task to give that opinion; but the decision for operation should rest with the surgeon and the anaesthetist.

Dr. Hales Wilson spoke again in reference to what had been said about the physician lecturing to embryo anaesthetists, who had stated that no patient who had had a cardiac infarct should have an anaesthetic. Dr. Hales Wilson said that that statement should be modified; no such patient should undergo an operation except with an expert anaesthetist. Dr. Joseph had said that the modern anaesthetist was expert in anaesthesia, but he was often not a very well trained physician, and often he had had no great experience in general medicine. Such an anaesthetist, who might be inclined to say that the patient was not fit for anaesthesia, was actually not in the best position to weigh the pros and cons of the question. The only way to arrive at a decision in the best interests of the patient was to have a conference between the anaesthetist, the surgeon and the physician.

Dr. F. R. N. STEPHENS referred to the effect of anaesthesia during electroconvulsive therapy. He said that he had had a moderate amount of experience in such anaesthesia. Often those patients were elderly and had cardio-vascular disease. During treatments he had taken a fair series of blood pressure readings, and by the use of a millimeter in the circuit, careful observations had been made of the changes in blood pressure associated with alterations in the current flowing through the head electrodes. In general there had been a rise of blood pressure which showed a fairly definite relationship to the current being passed. In physically fit individuals, the average shock used by a psychiatrist produced a systolic rise of about 100 millimetres of mercury and a fairly proportionate rise in diastolic pressure. However, in patients who had myocardial disease or who were heavily saturated with sedative drugs, that rise in blood pressure was not so great. Various cardiac irregularities were very common. Dr. Stephens went on to say that in his opinion many psychiatrists were not fully aware of the great value of atropine during electroconvulsive therapy, and that more than average doses of atropine were necessary to control the profuse secretions formed. Furthermore, some physicians thought that the administration of short-acting relaxants would prevent a hypertensive reaction because of the patient's flaccid state. Dr. Stephens pointed out that the patients in his series were all flaccid under a short-acting relaxant, and that that did not prevent the rise of blood pressure or development of cardiac irregularities. The premedication suggested was one one-hundredth of a grain of atropine for very slight adults, one-seventy-fifth of a grain of atropine for average adults and one-fiftieth of a grain of atropine for heavy adults. The atropine was usually combined with pethidine (from 50 to 100 milligrammes), and the whole was given by hypodermic injection three-quarters of an hour before treatment. The principal technique used was that of Cerletti—200 milliamperes for 10 seconds and 100 milliamperes for 30 seconds. The millimeter was calibrated from zero to 250 milliamperes.

Dr. BRIAN DWYER said that he thought one of the most useful ways in which a physician could help the anaesthetist was in the diagnosis and interpretation of the various heart murmurs that were found in the pre-operative examination of the patient. Unfortunately, at times, the diagnosis was made only after the patient had collapsed under anaesthesia. Dr. Dwyer recalled one case of pulmonary stenosis in which that had occurred. He pointed out that no one had discussed the problems of anaesthesia in patients with valvular stenosis and a fixed cardiac output. Those patients were particularly prone to sudden cardiac arrest during induction of anaesthesia. Dr. Dwyer disagreed with the statements made that neither spinal nor local analgesia

was desirable in patients with pre-existing cardiac disease. He considered those methods ideal for a relatively minor operation; such an operation could be easily performed under a spinal or local analgesic technique which in no way affected the muscles of respiration or the sympathetic component of the autonomic nervous system.

Dr. Howe, from the chair, referred to the effect of posture. He said that he had seen a patient die very rapidly on being put into the lithotomy position. He was certain that for patients showing any evidence of cardiac failure, to do so could be a very lethal thing.

Dr. R. B. HOLLAND said that the question of posture was very acute, and he asked Dr. Marshall to comment on the effect of the prolonged Trendelenburg position in a patient with just compensated heart disease undergoing, for example, an abdomino-perineal resection or some similar procedure for an adequate indication. Dr. Holland remembered one patient who had developed edema of the conjunctiva after being in the Trendelenburg position for an hour or so.

Dr. Marshall, in reply, referred first of all to what Dr. Puffett had said about the fact that thrombosis could become progressive and go on for a period of days. Dr. Marshall said that he entirely agreed. The question of coronary occlusion and surgery was very grave, and much more had to be learnt about it. From the anaesthetist's point of view Dr. Marshall did not approve of therapy with hypotensive drugs. He would be much happier if patients did not have them before operation. A patient coming out of an anaesthetic and under the influence of such drugs presented an added risk. In reply to Dr. Davis, Dr. Marshall said that it was essential to give neostigmine if any significant quantity of a curarizing drug had been used, even if there seemed no obvious indication at the termination of the operation. Cases were on record in which such patients had lapsed back into paresis some time after having left the operating theatre. Sometimes, however, a comparatively small dose of neostigmine was adequate. That should always be preceded by atropine in full dosage, given intravenously about ten minutes beforehand. If the response was unduly slow, then more neostigmine could be given. Dr. Marshall said that he had had no experience of the shorter-acting anticholinesterases. In reply to Dr. Sara, who had referred to cyanosis in dental anaesthesia, Dr. Marshall said that at the present time there was no need for that condition to occur, even in dental work. It should be possible to prevent it by a moderate supplement of trichlorethylene or even ether. Cyanosis should never be allowed to occur with any anaesthetic. If it did occur, that was due either to an excess of nitrous oxide or to impaired pulmonary ventilation. Dr. Marshall then referred to the statement that a patient who had had a recent coronary occlusion should never be subjected to anaesthesia. He said that he could not accept that restriction. What was to happen if the patient suddenly developed acute appendicitis or something worse? Obviously, however, if it was possible to delay operation for three or four months, while the physician or the patient cured the infarction, that was a good idea. In reply to Dr. Stephens's remarks about anaesthesia in electro-convulsive therapy, Dr. Marshall said that he had had a fair amount of experience in that field. He had not made the very careful observations that Dr. Stephens reported. Dr. Marshall did not think it necessary to worry about the rises in blood pressure that Dr. Stephens had observed. The patients seemed to survive nevertheless. They had to be kept well oxygenated and "decarbonized". On the question of the use of atropine, Dr. Marshall said that he agreed with Dr. Stephens, but not from the point of view of controlling secretions. Those patients rarely produced enough secretions to cause trouble. The use of atropine was chiefly to protect the patient against bradycardia. Dr. Marshall repeated his statement that he preferred general anaesthesia to local or spinal analgesia for the patients under discussion. Such patients were usually in a tense emotional state, and if, for example, they were undergoing a stellate ganglionectomy, the use of local analgesia might easily favour cardiac arrest. On the question of posture, Dr. Marshall said that it could undoubtedly have a serious effect. Bad posture could gravely affect the ventilation of any patient under an anaesthetic. The use of the lithotomy position for an emphysematous old man caused great venous and pulmonary congestion; the cure was to put his legs down. The same observation applied to the Trendelenburg and prone positions. Surgeons should not demand them indiscriminately. If, in addition, one paralysed the patient with curare, the inflation of his lungs could become very difficult indeed. Dr. Marshall finally said that edema of the conjunctiva was often seen in any operation on a patient in the Trendelenburg position with a tight mask-harness on his head.

Dr. Puflett, in reply, said that he agreed with what Dr. Hales Wilson had said. Referring to Dr. Bartrop's comment on the use of reserpine and peripheral ganglion-blocking agents, Dr. Puflett said that he did not think reserpine derivatives mattered, but hexamethonium compounds with their ability to cause sharp falls in blood pressure could contribute to hypotension, and should not be given for some time before operation. Usually the effects of those drugs were finished within 24 or 48 hours; but Dr. Puflett himself had seen a patient have hypotensive effects as long as three weeks after the drugs had been stopped. Dr. Puflett said he agreed with Dr. Lawes that the electrocardiographic tracing might present a difficult problem. That led to what Dr. Joseph had said about the physician's role being merely an advisory one in deciding whether an operation should be performed or not. Dr. Puflett said that his own paper had been given purely in that capacity. He had made no attempt to make hard and fast regulations, but had merely outlined the problems and dangers. Nearly 5% of myocardial infarctions occurred after operation. As he had pointed out in his paper, the position could be very complex. Arrhythmias were a very difficult problem, and the assessment of some other cardiac conditions was not easy. Physicians could only sum up the case for the anesthetists, and hand it over to them. He hoped that the anesthetists were erudite on the drugs that were given. Referring to Dr. Stephens's remarks on the effects of anesthesia in shock therapy, Dr. Puflett said that he had seen a few fatalities occur under those conditions. In his experience the patients who died had had coronary heart disease. As he had said in his paper, when one gave a shock, one started a cardiac arrhythmia by starting a focus of increased electrical excitability. It was very difficult in going over those cases to find how deeply anesthetized the patient was at the time of the shock. In reply to what Dr. Dwyer had said on the subject of cardiac murmurs, Dr. Puflett said that he had avoided that problem in his paper. It was not the presence of a murmur *per se* that was important—it was the effect on the circulation. The physician could assess the functional effects of mitral murmurs quite well. Most of their effects were on the ventricles, and so fell under headings dealt with in his paper. The danger of a fixed and restricted output in mitral stenosis was peripheral failure due to hypotension. On the question of the effect of posture, Dr. Puflett said that he could only support what Dr. Marshall had said. In the group of people under discussion—a hyperkinetic group with a high output and high venous return—sudden raising of their legs increased the return to the heart, causing overloading of an already struggling left ventricle.

Dr. Howe, from the chair, said that the papers had been very interesting and the discussion informative. There was no doubt that under modern conditions the anesthetist with his anesthetic cocktail could surprise other practitioners with what he could do. The physicians could contribute greatly to the safety of the patient.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

SURPLUS OF DOCTORS.¹

[From the *Australasian Medical Gazette*, September, 1891.]

We again take the opportunity of warning medical practitioners in the older countries that Australia is over supplied with medical men and that the proportion in relation to the population is probably greater than in England. Certain disappointment, perhaps great poverty and distress, inevitably await a medical stranger who comes to these colonies without intimate connection with influential residents except he has ample means. It should also be remembered that the prizes here for the best men are nothing like equal to those in the capital cities of the United Kingdom. Any vacancies in the junior ranks are at once filled by graduates of the local schools.

¹ From the original in the Mitchell Library, Sydney.

Correspondence.

SUPERANNUATION PROVISIONS FOR PRIVATE PRACTITIONERS.

SIR: The founders and trustees of the Queensland Medical and Associate Professions Superannuation Plan are very grateful for the publicity given to it in the editorial of January 4, 1958.

I would like to emphasize: (i) that contributions up to £300 *per annum* are deductible from income for income tax purposes; (ii) that as the *Income Tax Acts* stand, the emerging benefit at maturity both as regards contributions and accruing interest will be regarded as capital and be completely free from taxation; (iii) annual temporary reducing assurance cover is obtained at a special low premium, the cover being greatest in the earlier years of membership in the fund and gradually diminishing as the member's security is increasing by the accumulating compound interest-bearing investments in the fund; (iv) the Taxation Commissioner has informed us recently that for the time being he will not insist that the sum available at death must be paid to the personal legal representative of the deceased member as provided for in the trust deed. Some authorities consider that this decision may have far-reaching effects in reducing probate and succession duties.

It would seem, then, that doctors wise enough to join this scheme will have maximum deductions from income tax, an estate ranging between £8000 and £25,000 free of income tax on its earnings, and free from taxation at maturity.

Yours, etc.,

NORMAN SHERWOOD,
Chairman of Founders, Medical
and Associate Professions
Superannuation Plan.

Wickham House,
Wickham Terrace,
Brisbane,
Queensland.
January 9, 1958.

SUPERVOLTAGE RADIOTHERAPY.

SIR: Whilst supporting the letter written by Mr. K. W. Starr which appeared in the issue of your Journal dated January 11, 1958, I would like to take the matter further.

After one visit to the United Kingdom and two to the United States in the past two and a half years for the purpose mainly of studying cancer, the impression has been gained of an increasing trend towards the surgical treatment of cancer in preference to radiotherapy. Of the various methods of treatment now available, surgery offers the best prospect of permanent cure and is practically the only hope in advanced or recurrent cases.

Although supervoltage radiotherapy using the cobalt unit or the linear accelerator is a comparatively new treatment in Australia, it has been used for many years in medical centres abroad. In fact, voltages of the order of 800 kilovolts (800,000 volts), which nearly approach megavoltage (1,000,000 volts), have been in use for more than 20 years in Chicago and New York. Much experience has been gained of this type of therapy, and yet no satisfactory series of figures have been published in world literature showing a five-year survival rate approaching 5% in deep-seated cancer for which this type of therapy was specifically designed.

It is a matter of continual amazement to me that governments such as the New South Wales Government and certain philanthropic bodies are prepared to spend large sums of money of the order of £30,000 to £50,000, which they do not appear to have, on the purchase of equipment which is known to be only of limited value, rather than to employ the knowledge, skill and ability which are comparatively cheap and are already available in this country. It is no doubt natural, as the outcome of human weakness and sympathy, to rationalize the expenditure of large sums of money with the belief that something is being done for the unfortunate sufferers of cancer.

The equipment already available in our leading hospitals is in the main sufficient for the treatment of cancer patients. For a fraction of the cost of the installation and maintenance of a supervoltage machine, certain additional surgical instruments of light and delicate pattern, which

are desirable and particularly suited to this type of work, could be purchased and supplied to these hospitals.

It is felt that the one-sided and, if I might say so, nauseating publicity given, for whatever motive, by the daily Press can only do harm to the cause which they wish to serve, and at the best will set the clock back ten years.

Yours, etc.,

193 Macquarie Street,
Sydney,
January 14, 1958.

J. CAMMERON LOXTON.

SIR: With reference to the letter re supervoltage radiotherapy written by Mr. K. W. Starr and appearing in your issue of the eleventh instant, it seems appropriate to state:

(a) A cobalt (theratron) beam therapy unit was installed at Royal Prince Alfred Hospital in October, 1956, by the New South Wales State Cancer Council and the Hospitals Commission of New South Wales to provide supervoltage radiotherapy for all suitable cases in the State. It has been in operation since December, 1956. Patients are referred to it from the four general teaching hospitals in Sydney—Sydney Hospital, St. Vincent's Hospital, Royal North Shore Hospital and the Royal Prince Alfred Hospital.

(b) From the commencement of operation of the unit, proper follow-up and records of all patients who have had this form of radiation therapy have been maintained. The follow-up examinations are made by the referring general or specialist surgeon together with the radiotherapists.

(c) At the appropriate time, a report recording the results of this special form of treatment and other relevant matters will be submitted to the New South Wales State Cancer Council and the Hospitals Commission of New South Wales.

Yours, etc.,

H. SMILE,
General Superintendent.

Royal Prince Alfred Hospital,
Missenden Road,
Camperdown,
New South Wales.
January 14, 1958.

ACUTE APPENDICITIS IN A CENTENARIAN.

SIR: I was interested to read the letter of Dr. Shappere, of January 18, 1958, on this subject, because a few years ago I had a similar experience in Warracknabeal (Victoria). In my case the patient was a man who, while his age could not be exactly verified, was definitely within a year of the hundred. He developed an attack of acute appendicitis while in hospital, and with some trepidation I decided he should be operated on. An acutely inflamed appendix was removed, and his convalescence was completely uneventful. He died some year or so later from pneumonia.

Incidentally, this case excited the attention of the American magazine *Time*, in which it was reported.

Yours, etc.,

J. J. SHEARBY.

379 St. Kilda Road,
Melbourne,
January 23, 1958.

THE PATIENT, THE SURGEON AND THE ANÆSTHETIST.

SIR: I read with considerable interest the letter of Mr. Susman in your Journal dated December 28, 1957. This was heightened several days later when I received a letter from a Melbourne specialist, to whom I had sent a patient for surgical treatment, written in almost identical vein. My own experience as a general practitioner confirms it all.

What has happened to the medical profession? Has the stage been reached when the hard-earned parchments afford no protection when, after mature judgement, the considered risk is taken to alleviate pain and suffering?

Two remedies suggest themselves. Firstly, a thorough revision of coroner court procedure in this country. English standards are clearly set out in the "British Encyclopedia of Medical Practice", Volume II, pages 15 to 21, and "Medical Progress", 1954, *ibidem*, pages 113 to 116. By comparison our

codex looks as though it has been drafted into the constitution straight from King Billy's tablet. According to these references, the office of coroner came under fire at the time of Magna Carta—i.e., when England was in mid-embryonic stage. Perhaps we have now reached that stage of development, so why not stage another Magna Carta to leucotomize the dysgraphia? I have an excellent site in mind for the new Runnymede. Secondly, some restriction should be placed on the growing cult of group practice. Most practices today are conducted on this principle in one form or another. Maybe it benefits the individual to the detriment of the profession as a whole. Maybe it breeds complacency to the common weal of the profession. Maybe it is legalized dichotomy.

Congratulations, Mr. Susman, for ventilating a repugnant trend in modern medical practice.

Yours, etc.,

G. J. KENNEDY.

Cobram,
Victoria,
January 10, 1958.

PSYCHIATRIC CONSEQUENCES OF RAUWOLFIA THERAPY.

SIR: In view of the widespread and somewhat unwarranted publicity that has been recently accorded, by certain newspapers and magazines, to the alleged ill effects of rauwolfia preparations in cases of hypertension and neuro-psychiatric states, we shall deem it a favour if you will publish our views on this matter in the correspondence columns of your Journal.

Having employed rauwolfia preparations (especially the whole root of the plant in tablet form), extensively and very often exclusively, in the treatment of high blood pressure cases for about 20 years, we have consistently found these preparations both useful and devoid of any ill effects in such cases. Of the thousands of hypertensives who have been treated in India by us during all these years, only a few complained of fatigue, sleepiness, mild drowsiness or unsteadiness, by-effects that quickly disappear on discontinuing this medication. We have not, as yet, encountered any instances of homicidal or suicidal tendencies or of atypical insanity as melodramatically described in some of the Australian newspapers of late.

Since the introduction of rauwolfia to the Western world in 1949, literally thousands of papers have been published in medical journals on the subject from all over the world. The great majority of these reports have been unanimous in proclaiming the drug as one of the safest and most useful of all the hypotensive agents known. Compared with the ganglion-blocking agents, veratrum alkaloids, thiocyanates and other proved hypotensive drugs, rauwolfia is unquestionably the most widely applicable and best tolerated.

Most of the newspaper publicity of recent months in Australia has arisen as the result of an unfortunate article published in Australia by Dr. F. J. Kyneur in *THE MEDICAL JOURNAL OF AUSTRALIA*. It was claimed by the author, on the basis of an apparently limited experience, that the drug tends to induce a serious form of insanity. We consider it most unfortunate that Dr. Kyneur should have condemned the drug after such a short and obviously inadequate trial of the same.

Yours, etc.,

ROBERT HEILIG, M.D., F.N.I., S.M.S.
Medical College, Jaipur.

RUSTOM JAL VAKIL, M.D. (London).
M.R.C.P. (London), Department
of Cardiology, King Edward
Memorial Hospital, Bombay.

India,
Undated.

Post-Graduate Work.

ST. VINCENT'S HOSPITAL, SYDNEY.

Monthly Seminars.

A SERIES of medical seminars will be held at St. Vincent's Hospital during 1958. These will commence on February 11, and will be held on Tuesdays at monthly intervals from 1.15 till 2 p.m. The programme is as follows: February 11,

"Some Principles of Teaching", Dr. A. Hogg, Teachers' College, University of Sydney. March 11, "The Investigation and Management of Hemolytic Anemia", Dr. R. Jeremy and Dr. P. Lamond. April 1, "Chronic Pyelonephritis", Professor M. L. Rosenheim, Professor of Medicine, University College, London. May 13, "The Circulation in Liver Disease", Professor C. R. Bickerton Blackburn. June 10, "The Cardiac Sphincter in Health and Disease", Dr. W. Hennessy. July 8, "Studies in Myasthenia Gravis", Dr. W. Burke. August 12, "Bacterial Endocarditis", Dr. J. Hickie. September 9, "The Investigation of Thyroid Disease", Dr. B. Curtin and Dr. P. George. October 14, "Sarcoidosis", Dr. A. G. McManis. November 11, "The Management of the Disseminated Reticuloses", Dr. W. R. Dalton and Dr. L. Atkinson. December 9, "Gastritis", Dr. E. Sibree, Dr. J. Garvan and Dr. W. Hennessy.

menstrual Syndromes", Professor B. T. Mayes and Dr. R. Reader. May 30, Gastro-Enterology Section, "A Critical Review of Liver Function Tests", Dr. D. Piper (by invitation) and Dr. J. Rankin. June 13, Hematology Section, "Pancytopenia", Dr. H. Kronenberg. June 20, Neurology Section, "Neuropharmacology", Professor P. Bishop, Professor of Physiology, University of Sydney. June 27, Cardiac Section, "Rehabilitation in Cardiac Disease".

Each seminar will be followed by a clinico-pathological session at 2.30 p.m. and a "grand rounds" clinical session at 5 p.m.

The Royal Australasian College of Physicians.

SEMINARS AT ROYAL PRINCE ALFRED HOSPITAL.

SEMINARS will be held on the following dates from 1.15 to 2.15 p.m. in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital, Sydney: February 21, Cardiac Section, "Symposium on Dyspnea". February 23, Thoracic Section, "Viral Infection in Respiratory Disease". March 7, Endocrinology and Metabolism Section, "Drug Reactions and Their Significance", Dr. T. M. Greenaway and Dr. E. J. C. Molesworth. March 14, Hematology Section, "Megaloblastic Anemias", Dr. Elvey, Sydney Hospital, by invitation. March 21, Gastro-Enterology Section, "The Duodenal Pacemaker", Mr. G. W. Milton, Department of Surgery, University of Sydney. March 28, special seminar, "Pheochromocytoma", Professor Rosenheim, Sims Professor. April 11, Neurology Section, "Organic or Functional?", Professor W. H. Trethowan, Professor of Psychiatry, University of Sydney. April 18, Renal Section, "Nephrotic Syndrome", Dr. D. Deller, by invitation. May 2, Paediatric Section, "The Pattern of Respiratory Infection in Childhood in 1957", Dr. E. Whealy and Dr. G. Angel; this seminar will be followed by a meeting at 4.15 p.m. at the Royal Alexandra Hospital for Children, Camperdown. May 9, Cardiac Section, "Drugs and the Heart". May 16, Thoracic Section, "Chronic Bronchitis". May 23, Endocrinology and Metabolism Section, "Pre-

SIMS COMMONWEALTH TRAVELLING PROFESSOR, 1958.

PROFESSOR M. L. ROSENHEIM, C.B.E., M.A. (Cambridge), M.D., B.Chir. (Cambridge), F.R.C.P., Professor of Medicine in the University of London and Director of the Medical Unit at the University College Hospital, London, will visit Australia and New Zealand as a Sims Commonwealth Travelling Professor for 1958. Professor Rosenheim will visit most States of the Commonwealth and will deliver lectures, conduct ward rounds and take part in clinico-pathological conferences and clinical meetings at the main teaching hospitals. He will also attend and take part in the annual meeting of The Royal Australasian College of Physicians in Sydney from June 3 to 7. Arrangements for his visit are being made by the College. His itinerary will be as follows: Perth, Tuesday, March 11, to Saturday, March 15; Adelaide, Sunday, March 16, to Saturday, March 22; Sydney, Saturday, March 22, to Saturday, April 12; New Zealand, Saturday, April 12, to Sunday, May 11; Melbourne, Sunday, May 11, to Tuesday, May 27; Brisbane, Tuesday, May 27, to Monday, June 2; Sydney, Monday, June 2, to Saturday, June 7.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JANUARY 11, 1958.*

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.*	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.*
Acute Rheumatism	2(1)	2(2)	4	..	..	..	..	..	8
Amoebiasis .. ..	..	..	5	..	..	..	..	..	5
Ankylostomiasis .. ..	..	..	..	..	..	..	..	..	..
Anthrax .. ..	..	..	..	..	..	..	..	..	..
Bilharziasis .. ..	..	..	..	..	..	..	..	..	..
Brucellosis	1	1(1)	..	..	..	..	..	..	2
Cholera .. ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) .. ..	..	1	..	..	..	..	..	..	1
Dengue .. ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile)	15(8)	9(7)	7(6)	..	1	..	1	1	34
Diphtheria	1(1)	..	..	..	..	..	..	..	1
Dysentery (Bacillary) .. ..	..	1(1)	..	..	1(1)	..	..	..	2
Encephalitis .. ..	..	8(6)	..	..	..	..	..	..	8
Filariasis .. ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice .. ..	..	..	..	..	..	..	..	..	..
Hydatid .. ..	..	..	..	..	..	..	..	..	..
Infective Hepatitis .. ..	..	31(7)	6	6(4)	16(1)	1	..	..	60
Lead Poisoning .. ..	..	..	..	..	..	..	..	..	..
Leprosy .. ..	..	..	..	..	..	..	2	..	2
Leptospirosis	3	..	..	..	..	..	..	..	3
Malaria .. ..	..	..	..	..	..	..	1	..	1
Meningococcal Infection	2(1)	3(3)	..	..	1(1)	..	..	..	6
Ophthalmia .. ..	..	..	..	..	..	..	..	..	1
Ornithosis .. ..	..	..	..	..	..	..	..	..	..
Paratyphoid .. ..	..	..	..	..	..	..	..	..	..
Plague .. ..	..	..	..	..	..	..	..	..	..
Poliomyelitis .. ..	..	1(1)	..	..	..	..	..	..	1
Puerperal Fever	2	..	..	..	..	..	..	..	2
Rubella .. ..	..	75(64)	2(2)	10(6)	20(18)	..	..	..	107
Salmonella Infection .. ..	..	..	2(2)	2(2)	..	..	..	..	4
Scarlet Fever	13(6)	37(31)	4(1)	1(1)	1	..	..	..	56
Smallpox .. ..	..	..	..	..	..	..	..	..	..
Tetanus .. ..	..	..	..	..	..	..	..	..	..
Trachoma .. ..	..	..	..	..	4(3)	..	..	..	4
Trichinosis .. ..	..	..	..	..	..	..	..	..	..
Tuberculosis	50(34)	27(18)	20(10)	10(8)	6(4)	1	1	..	115
Typhoid Fever	1(1)	..	..	..	1(1)	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne) .. ..	..	..	1	..	..	..	..	..	1
Typhus (Louse-borne) .. ..	..	..	..	..	..	..	..	..	..
Yellow Fever .. ..	..	..	..	..	..	..	..	..	..

* Figures in parentheses are those for the metropolitan area.

The College of General Practitioners.

VICTORIA FACULTY.

Aaron Cohen Prize Essay Competition.

THE Board of the Victoria Faculty of the College of General Practitioners announces that 23 interstate and Victorian entries were received for the Aaron Cohen Prize Essay Competition; all were considered of high standard. The prize winners are as follows: first prize (£100), Dr. P. P. Manzie, West Wyalong, New South Wales; second prize (£50), Dr. J. M. Woods, Newcastle, New South Wales; third prize (£25), Dr. T. V. Walpole, Horsham, Victoria; *proxime accessit*, Dr. T. R. Thomson, North Caulfield, Victoria.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Lucey, Maureen, M.B., B.S., 1956 (Univ. Sydney), 129 Kurraha Road, Neutral Bay, New South Wales.

Levitski, Aleksander, M.D., 1923 (Univ. Tartu), registered in accordance with the provisions of Section 17 (2A) (c) of the Medical Practitioners Act, 1938-1957, 52 Australia Street, Camperdown, New South Wales.

Ackermann, Isidor Anthony, M.D., 1940 (Univ. Bucharest), registered in accordance with the provisions of Section 17 (1c) of the Medical Practitioners Act, 1938-1957, 47 Birriga Road, Bellevue Hill, New South Wales.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Belfer, Joseph Boris (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Burstal, James Richard (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Cleary, Maurice Patrick (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Farley, Marree Mildred (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Harris, Kenneth Godfrey (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Kellerman, Gordon Ellis (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Macdonald, Roderick Donald (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Raphael, Beverley (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Shead, Geoffrey Vernon (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Sheather, Rosemary (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Taylor, John Stuart (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Tonking, Barbara Mary (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Tugwell, Wilton Dunstan (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Warren, Ronald Herbert (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Willis, Carole Patricia (provisionally registered), M.B., B.S., 1958 (Univ. Sydney); Blumer, Alfred John, M.B., B.S., 1957 (Univ. Sydney); Haber, Richard William, M.B., B.S., 1957 (Univ. Sydney); Mitchell, Lindsay, M.B., B.S., 1955 (Univ. Sydney); Tippet, George Henry King, M.B., B.S., 1957 (Univ. Melbourne); Harrison, John Anthony, M.B., B.S., 1956 (Univ. Sydney); O'Higgins, James Patrick Dermott, L.A.H. (Dublin), 1949; Reichardt, Julius Emery, M.D., 1940 (Univ. Cluj, Rumania) (licensed under Section 21C of the Medical Practitioners Act, 1938-1957); Schultheisz, Ladislays, M.D., 1924 (Univ. Budapest) (licensed under Section 21C of the Medical Practitioners Act, 1938-1957); Szechowycz, Bohdan, M.D., 1950 (Univ. Erlangen) (licensed under Section 21C of the Medical Practitioners Act, 1938-1957).

Medical Appointments.

Dr. H. C. Murphy has been appointed Director of Maternal and Child Welfare in the Department of Health and Home Affairs, Queensland.

Dr. P. R. Patrick has been appointed Chief Medical Officer of School Health Services in the Department of Health and Home Affairs, Queensland.

Dr. R. J. B. Anderson has been appointed Medical Officer to the Chest Clinic in the Department of Health and Home Affairs, Queensland.

Deaths.

THE following deaths have been announced:

KLUG.—Cecil Conrad Klug, on January 19, 1958, at Parkville, Victoria.

LOVE.—George Cross Love, on January 21, 1958, at Melbourne.

Diary for the Month.

FEB. 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

FEB. 13.—New South Wales Branch, B.M.A.: Public Relations Committee.

FEB. 14.—Tasmanian Branch, B.M.A.: Branch Council Meeting.

FEB. 14.—Queensland Branch, B.M.A.: Council Meeting.

FEB. 18.—New South Wales Branch, B.M.A.: Medical Politics Committee.

FEB. 20.—Victorian Branch, B.M.A.: Executive Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

Queensland Branch (Honorary Secretary, 38 L'Estrange Terrace, Kelvin Grove, Brisbane, W.1): All applicants for Queensland State Government Insurance Office positions are advised to communicate with the Honorary Secretary of the Branch before accepting posts.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in Australia can become subscribers to the Journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 per annum within Australia and the British Commonwealth of Nations, and £6 per annum within America and foreign countries, payable in advance.

ILLUSTRATIONS TO THE ARTICLE BY P. A. TOMLINSON.



FIGURE II.
Large penetrating ulcer high on lesser curvature.



FIGURE III.
Same patient as in Figure I. Large penetrating ulcer high on lesser curvature and posterior gastric wall. Different posture indicates fixity of ulcer.



FIGURE IV.
Large penetrating ulcer high on lesser curvature and posterior wall.



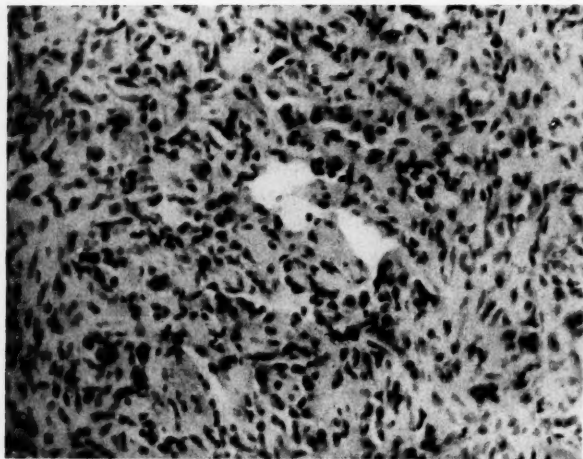
FIGURE VI.
Barium meal X-ray examination of patient with pyloric ulcer penetrating gall-bladder.



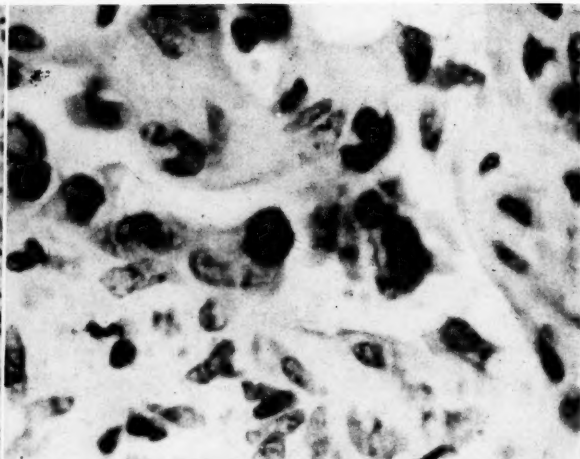
FIGURE VII.
Same patient as in Figure VI. Cholecystogram.

ILLUSTRATIONS TO THE ARTICLE BY A. M. MACINTOSH AND A. E. GATENBY.

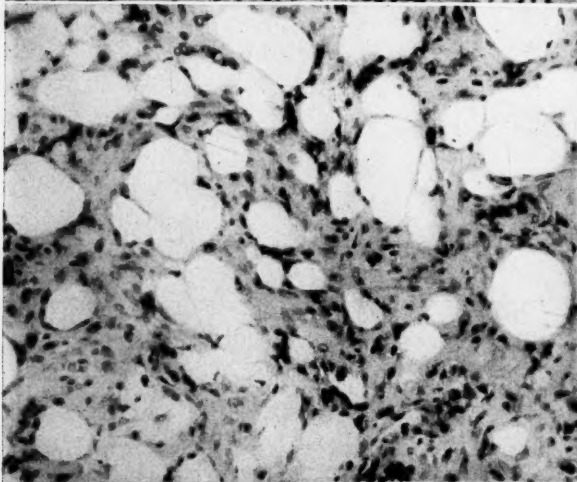
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a



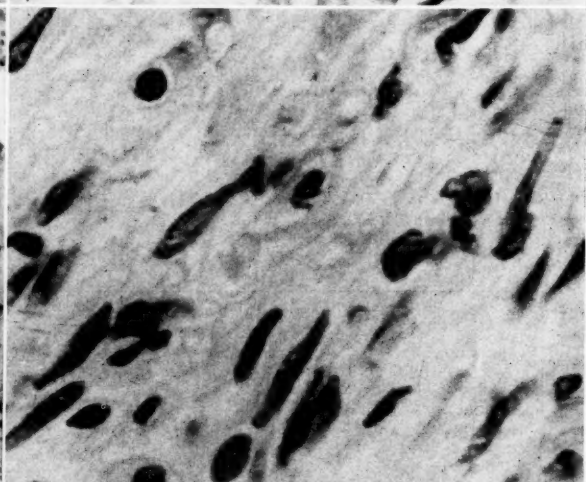
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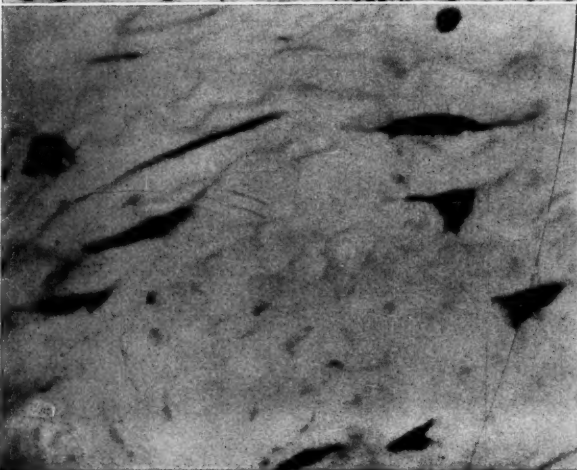
4



5



6



7

